User Manual

DA14580/581/583 Bluetooth Smart development Kit – Pro

UM-B-034

Abstract

This document describes the Bluetooth Smart Development kit - Pro based on DA14580/581/583. It helps users to set up the hardware development environment, install required software and quickly start product development with help of example source code.

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1 Terms and definitions

BLE	Bluetooth Low Energy
CS	Chip Select
DK	Development Kit
EEPROM	Electrically Erasable Programmable Memory
FTDI	Brand name of USB – UART interface
GPIO	General Purpose Input Output
OTP	One Time Programmable
PCB	printed circuit board
QFN	Quad-Flat No-leads
SDK	Software Development Kit
SPI	Serial Peripheral Interface
SRAM	Static Random Access Memory
SWD	Serial Wire Debug
USB	Universal Serial Bus
UART	Universal Asynchronous Receiver/Transceiver
WLCSP	Wafer Level Chip Scale Packaging
WoW	Way of Working

2 References

1. DA14580, Datasheet, Dialog Semiconductor
2. DA14581, Datasheet, Dialog Semiconductor
3. UM-B-015, DA14580_581_583 Software Architecture, Dialog Semiconductor
4. DA14580_CB PXI QFN40 layout, Dialog Semiconductor
5. DA14580_CB_PXI_QFNP40, Dialog Semiconductor
6. DA14580_CB_PXI_WLCSP, Dialog Semiconductor
7. DA14580_CB_PXI_WLCSP_layout, Dialog Semiconductor
8. DA14580_MB_VB_layout, Dialog Semiconductor
9. DA14580_CB PXI_QFN48, Dialog Semiconductor
10. UM-B-005, DA14580_581_583 Peripheral Examples, Dialog Semiconductor
11. UM-B-010, DA14580_581_583 Proximity application, Dialog Semiconductor
12. AN-B-015, DA14580 Supply current measurement, Dialog Semiconductor

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3 Introduction

DA14580/581/583 is a Bluetooth Smart chip, working with extremely low power while providing world-class RF performance, a small footprint and flexible peripheral configurations for a wide range of applications. The development kit includes a set of hardware (e.g. development board with on-board debugger), a Software Development Kit (SDK) (e.g. development tools, source code examples documents and so on) along with documentation. This document helps users to set up hardware/software development environment, install required software and quickly start product development with the help of example source code.

Web content can be downloaded at:
www.dialog-semiconductor.com/support.

Product information about the DA14580/581/583 can be found at:
http://www.dialog-semiconductor.com/products/bluetooth-smart

Product information about the DA14580/581/583 Development Kit - Pro can be found at:
http://www.dialog-semiconductor.com/products/bluetooth-smart/smartbond-development-tools/da14580-development-kit-pro

The DA14583 is DA14580 plus 1Mbit SPI memory in same package.

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3.1 Hardware content

In **Error! Reference source not found.** the kit components are shown and Table 1 contains an overview the parts.

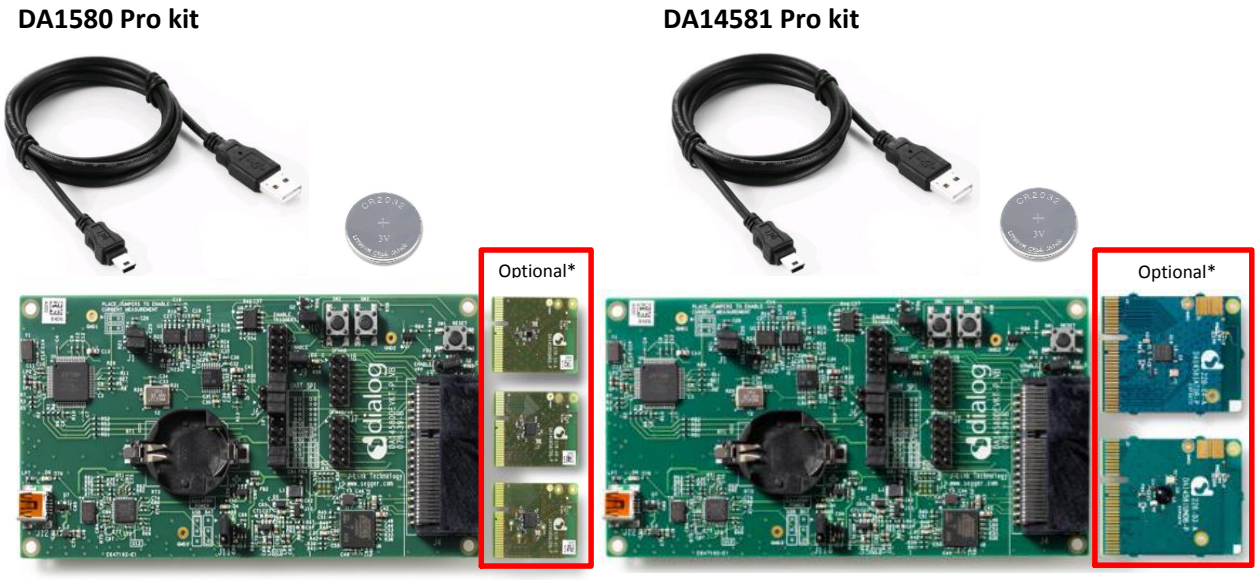

Figure 1: DA14580/581 - Pro kit

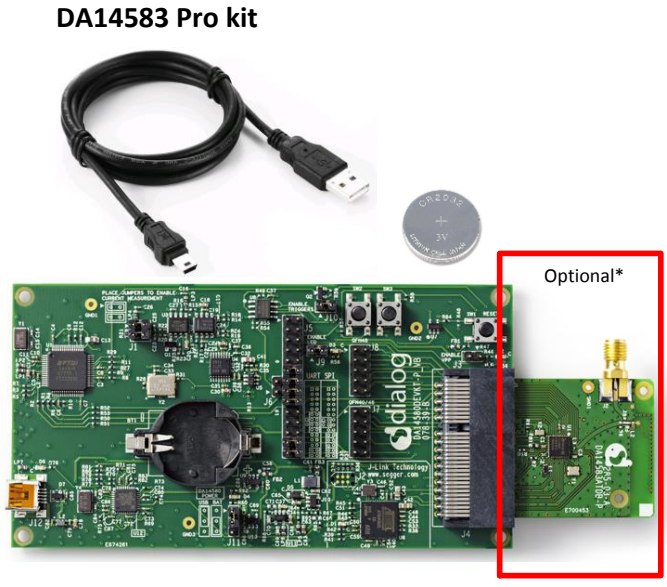

Figure 2: DA14583 - Pro Kit

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Table 1: Content of the DA14580/581/583 Pro Kit

DA14580/581/583 DEVKT – PRO:	Included in the kit	Separate option for the 580 kit*	Separate option for the 581 kit*	Separate option for the 583 kit*
Battery CR2032	X			
Mini USB Cable	X			
DA14580A3DB-P (QFN48)		X		
DA14580ATDB-P (QFN40)		X		
DA14580UNDB-P (WL-CSP)		X		
DA14581UNDB-P (WL-CSP)			X	
DA14581ATDB-P (QFN40)			X	
DA14583ATDB-P (QFN40)				X
DA14580DEVKT-P_VB (Main board)**	X			
USB Dongle	X			

Note 1 * Not included in the kit, must be bought separately.

Note 2 ** The mainboard is compatible with all boards.

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3.2 Web content

3.2.1 Software Development Kit content

3.2.1.1 Tools

Web-link: www.dialog-semiconductor.com/support

SmartSnippets

SmartSnippets is a framework of PC based tools to control DA14580/581/583 development kit, consisting of:

- Power Profiler : Real time current consumption measurement to for the DA14580/581/583 motherboard
- OTP Programmer: Tool for OTP memory programming
- UART/JTAG booter: Tool for downloading hex files to DA14580/581/583 SRAM over UART or JTAG
- SPI & EEPROM programmer: A tool for SPI & EEPROM flash programming
- Sleep Mode Advisor: Calculation tool to determine most optimal sleep modes

ConnectionManager

ConnectionManager is a PC based software tool to control the link layer of the DA14580/581/583 with the following capabilities:

- Functional in Peripheral and Central role
- Set advertising parameters
- Set connection parameters
- Reading from Attribute database
- Perform production test commands

3.2.1.2 SDK documents

- UM-B-003, DA14580_581_583 Software development guide
- UM-B-004, DA14580_581_583 Peripheral drivers
- UM-B-005, DA14580_581_583 Peripheral examples
- UM-B-006, DA14580 Sleep mode configuration
- UM-B-007, DA14580 Software Patching over the Air (SPOTA)
- UM-B-008, DA14580 Production test tool
- UM-B-010, DA14580_581_583 Proximity application
- UM-B-011, DA14580 Memory map – scatter file
- UM-B-012, DA14580 Secondary boot loader
- UM-B-013, DA14580 External Processor Interface over SPI
- UM-B-014, DA14580 Bluetooth Smart Development Kit - Expert
- UM-B-015, DA14580_581_583 Software architecture
- UM-B-016, DA14580 Software Porting Guide
- UM-B-017, DA14580 GTL interface Integrated Processor Application

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3.2.1.3 SDK source code examples (created in Keil)

- **dk_apps.** This folder holds all the necessary folders needed for DA14580/581/583 application development.
  - **dk_apps\keil_projects\proximity**:

    The folder contains the following subfolders and in each one of them resides the respective project file:

Table 1: SDK Examples

Folder	Project File	Description
prox_monitor_ext\Keil_4 **prox_monitor_ext\Keil_5**	prox_monitor_ext.uvproj prox_monitor_ext_581.uvproj prox_monitor_ext_583.uvproj prox_monitor_ext.uvprojx prox_monitor_ext_581.uvprojx prox_monitor_ext_583.uvprojx	Proximity Monitor (External processor configuration)
prox_reporter_ext\Keil_4 **prox_reporter_ext\Keil_5**	prox_reporter_ext.uvproj prox_reporter_ext_581.uvproj prox_reporter_ext_583.uvproj prox_reporter_ext.uvprojx prox_reporter_ext_581.uvprojx prox_reporter_ext_583.uvprojx	Proximity Reporter (External processor configuration)
prox_reporter\Keil_4 **prox_reporter\Keil_5**	prox_reporter.uvproj prox_reporter_581.uvproj prox_reporter_583.uvproj prox_reporter.uvprojx prox_reporter_581.uvprojx prox_reporter_583.uvprojx	Proximity Reporter (Integrated processor configuration)
prox_monitor_ext_usb\Keil_4 **prox_monitor_ext_usb\Keil_5**	prox_monitor_ext_usb.uvproj prox_monitor_ext_usb_581.uvproj prox_monitor_ext_usb_583.uvproj prox_monitor_ext_usb.uvprojx prox_monitor_ext_usb_581.uvprojx prox_monitor_ext_usb_583.uvprojx	Proximity Monitor (External processor configuration) Version for USB dongle
prox_reporter_ext_usb\Keil_4 **prox_reporter_ext_usb\Keil_5**	prox_reporter_ext_usb.uvproj prox_reporter_ext_usb _581.uvproj prox_reporter_ext_usb _583.uvproj prox_reporter_ext_usb.uvprojx prox_reporter_ext_usb _581.uvprojx prox_reporter_ext_usb _583.uvprojx	Proximity Reporter (External processor configuration) Version for USB dongle
prox_reporter_ext_spi\Keil_4 **prox_reporter_ext_spi\Keil_5**	prox_reporter_ext_spi.uvproj prox_reporter_ext_spi_581.uvproj prox_reporter_ext_spi_583.uvproj prox_reporter_ext_spi.uvprojx prox_reporter_ext_spi_581.uvprojx prox_reporter_ext_spi_583.uvprojx	Proximity Reporter (External processor) SPI version

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- **dk_apps\keil_projects\prod_test:** These folders include the source code of the production test firmware. Refer to DA14580_581_583 _Production_Test_Tool.docx for more information how to build and use it.
- **dk_apps\keil_projects\template:** These folders include a template as a starting point of a new application.

For details, please read [9].

- **host_apps:** This folder holds the DA14580/581/583 PC applications:
  - ***host_apps\windows\proximity:*** The folder includes two Windows C++ applications, with each one acting as part of a proximity monitor and a proximity reporter application. They are placed in subfolders *monitor* and *reporter* respectively.
    For details, please read the *DA14580_581_583 Proximity Application* Guide.
  - **host_binaries\windows\proximity:** The folder includes two pre-compiled Windows executables which correspond to the C++ applications described right above and are included for user convenience.
  - **peripheral_examples:** The folder includes sample code of how to use peripheral blocks of the DA14580/581/583(e.g. UART, SPI, I2C etc.) bundled to a demo-kit. For details, please refer to [10].
- Tools:
  - **tools\prod_test\prod_test_cmds:** This folder includes the source code of the production test tool. Refer to DA14580/DA14581_Production_Test_Tool.docx for more information how to build and use it.

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3.3 DA14580 - DA14581 Pro kit

3.3.1 Differences between the DA14580, DA14581 and DA14583

The only hardware difference between the daughter boards of the DEVKT-Pro 14580 and the DEFKT-Pro 14581, is the design in of QFN48 (580) and the QFN40 (581). The silkscreen may have small textual differences.

The DA14581 uses a dedicated ROM which offers optimisations **targeting A4WP and HCI.**

Table 2: DA14580

Product	Memory size	General Purpose I\O's	Package	Key Features	Applications
WLCSP34	ROM 84kBytes OTP 32kBytes RAM 50kBytes	12	2.5x2.5x0.5mm, pitch 0.4mm	• Bluetooth 4.0 + 4.1 • Cortex M0 application processor • Power supply 0.9 -3.3V • Single pin RF I/O • Rich set of analog and digital peripherals	Beacon & Proximity Health & Fitness HID Smart Home
QFN40		24	5x5x0.9mm, pitch 0.4mm		
QFN48		32	6x6x0.9mm, pitch 0.4mm		

Table 3: DA14581

Product	Memory size	General Purpose I\O's	Package	Key Features	Applications
WLCSP34	ROM 84kBytes OTP 32kBytes RAM 50kBytes	12	2.5x2.5x0.5mm, pitch 0.4mm	• Bluetooth 4.0 + 4.1 • Cortex M0 application processor • Power supply 0.9 -3.3V • Single pin RF I/O • Rich set of analog and digital peripherals • 8 connections • Optimized boot time	Wireless charging (A4WP) HCI
QFN40		24	5x5x0.9mm, pitch 0.4mm		

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Table 4: DA14583

Product	Memory size	General Purpose I\O's	Package	Key Features	Applications
	ROM 84kBytes OTP 32kBytes RAM 50kBytes			• Bluetooth 4.0 + 4.1 • Cortex M0 application processor • Power supply 2.35 -3.3V • Single pin RF I/O • Rich set of analog and digital peripherals	Beacon & Proximity Health & Fitness HID Smart Home
QFN40		24	5x5x0.9mm, pitch 0.4mm		

- A4WP wireless charging features:
  - Fast boot time for Power Receiving Unit (PRU)
  - 8 connections for Power Transmitting Unit (PTU)
- HCI features:
  - Optimized code for HCI which fits into the OTP
  - This enables customers/modules makers to provide a pre-programmed HCI module

Remark: DA14583 will run in BUCK mode only!

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3.4 Pinning

In Figure 3 the pinout of the DA14583 is shown. New, compared to the DA14580/581, are the connections to the internal SPI flash memory.

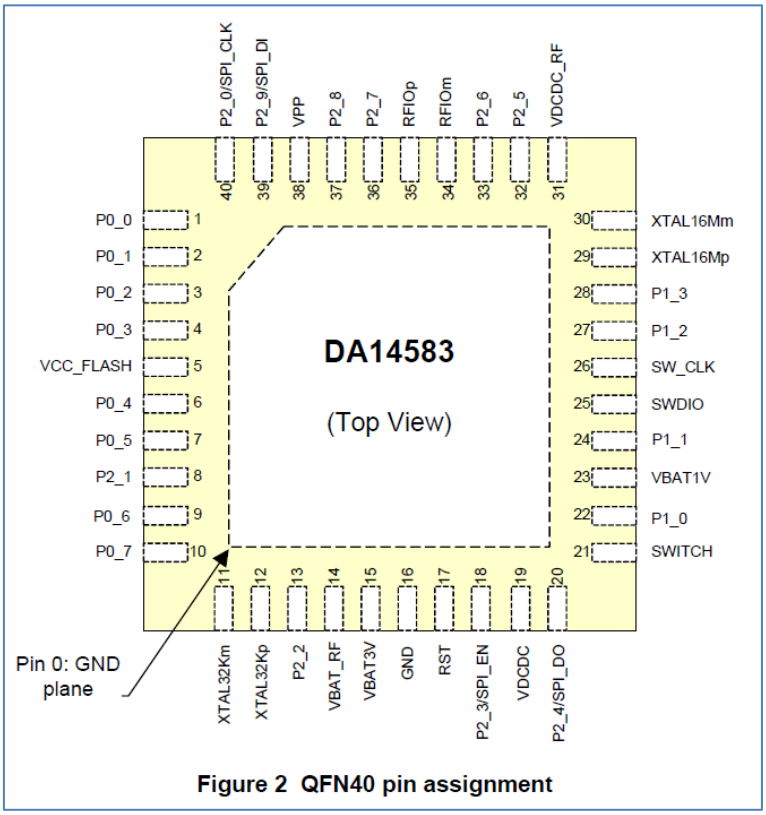

Figure 2 QFN40 pin assignment

Figure 3: QFN40 pin assignment from datasheet

Table 5: SPI connections

port DA14583	function	remark
P2_0	SPI_CLK	SCLK (Note 1)
P2_9	SPI_DI	MOSI (Note 1)
P2_4	SPI_DO	MISO (Note 1)
P2_3	SPI_EN	not to be used for external SPI (!)
	VCC_FLASH	power for internal Flash Memory
	GND	

Note 1 shared with internal flash memory

When external SPI components are used, SPI_EN is occupied for internal use. Another pin should be chosen for SPI_EN of the external component.

By using a Secondary Bootloader the proper pins are programmed to load the booting software from the SPI-memory at startup.

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3.4.1 PCB design and functionalities

The top-screen layer of the pro kit PCB is shown below in Figure 4.

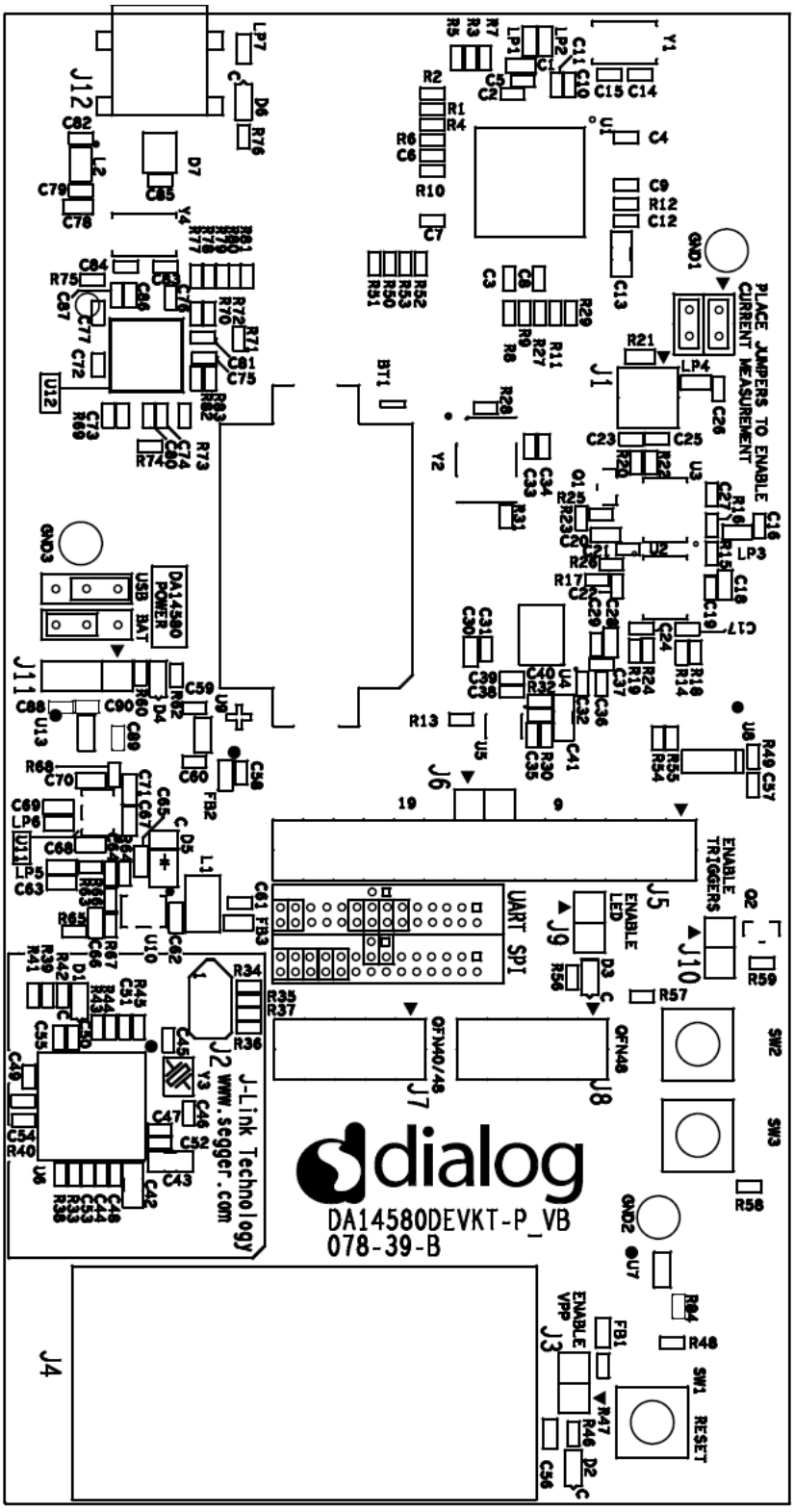

Figure 4: DA14580 Development Kit – Pro (PCB topview)

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3.4.2 Configuring the Pro kit-board by jumper settings

There are two configurations that can be switched; the default configuration that supports the boot from UART or the configuration that supports boot from an external SPI flash memory.

The jumper settings are displayed below.

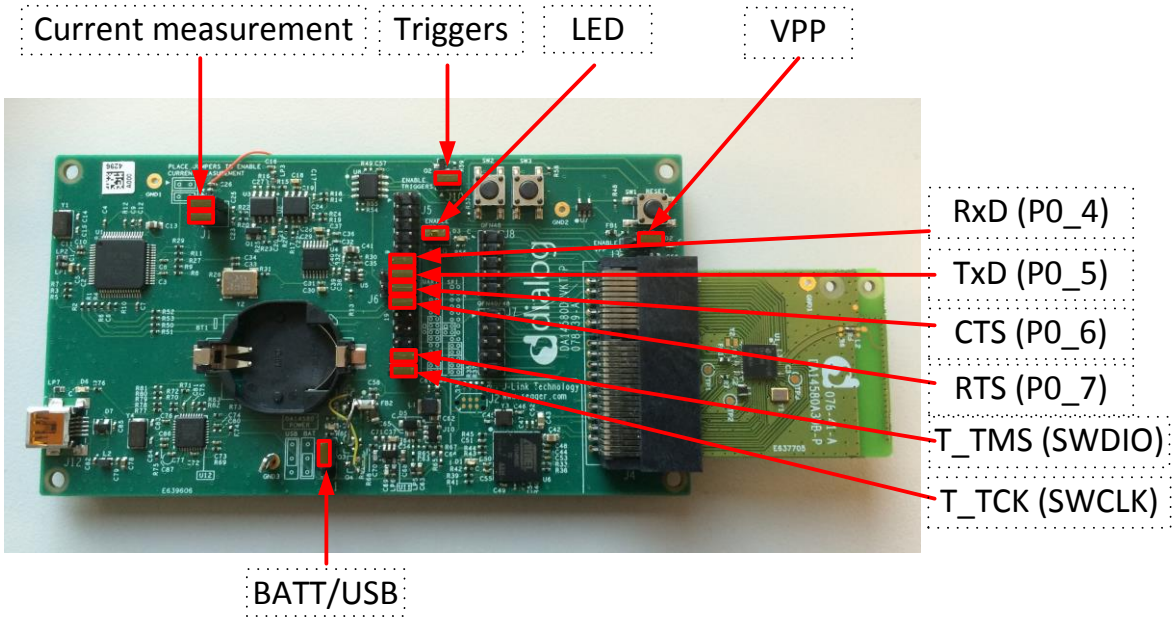

Figure 5: DA14580/581/583 (Fabrication default)
UART boot settings (T_TxD : (P0_5) and T_RxD : (P0_4))

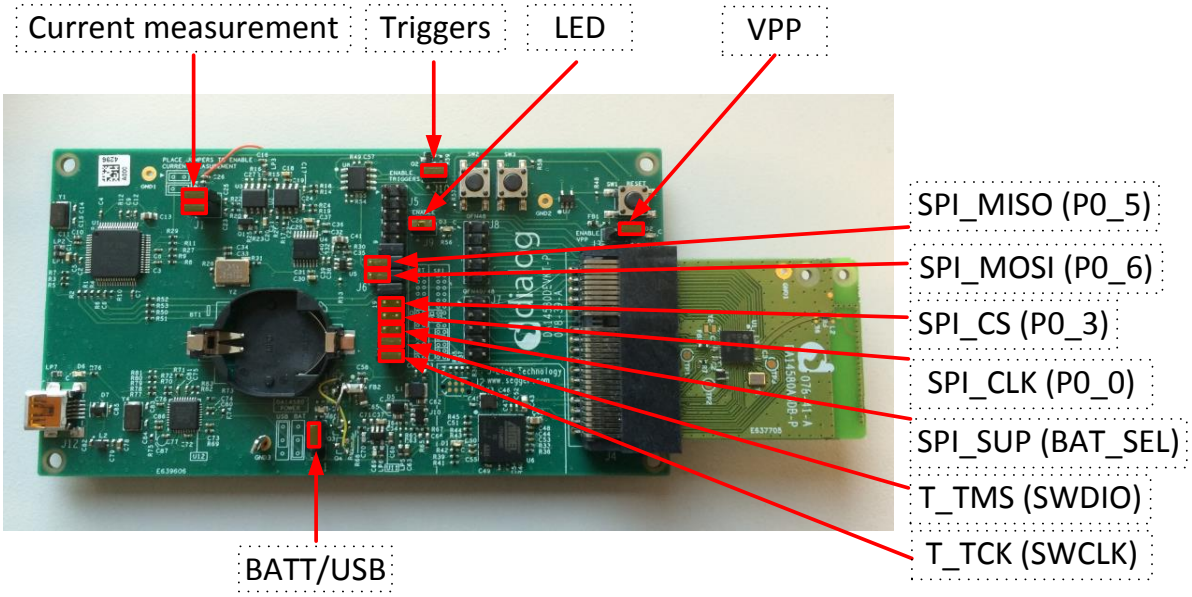

Figure 6: DA14580/581 Boot from external SPI memory

Note 2 These functionalities are shown in detail in Appendix A

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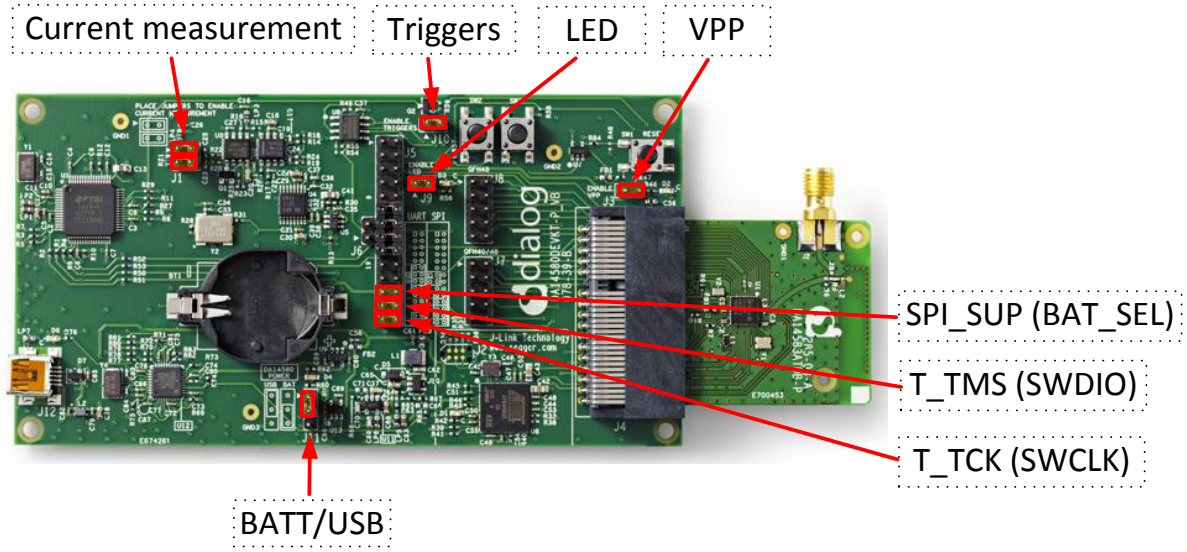

Figure 7: DA14583 Boot from internal SPI memory

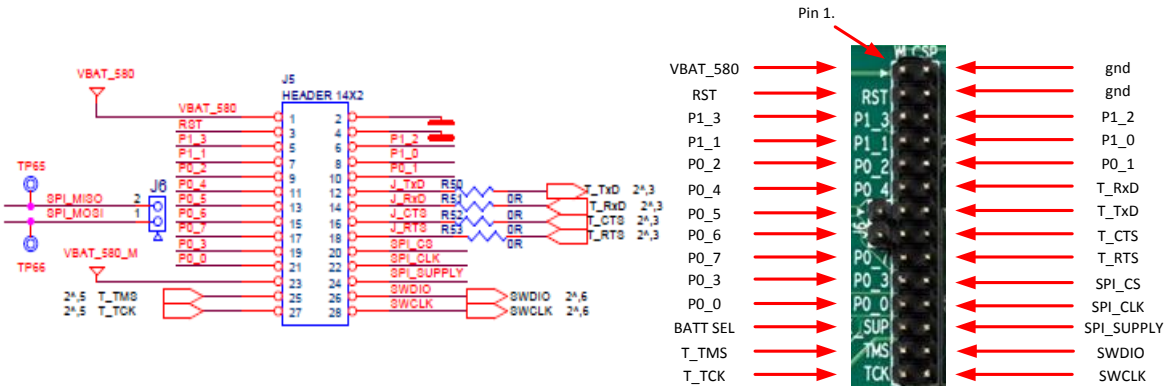

Figure 8: Layout of headers J5 and J6

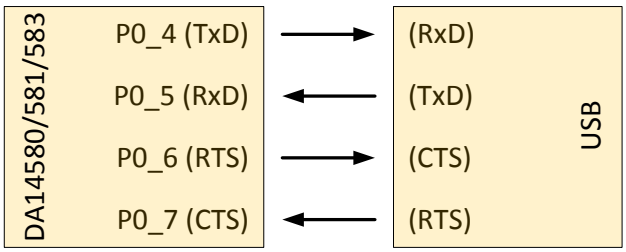

Figure 9: UART Data Direction of Uart within J5

Example: when jumper J5 (27-28) is placed, connection 'T_TCK = SWCLK' is made.

In Figure 5 and Figure 6 the connections are added next to the arrows.

On this board only the buck mode is used. A choice can be made between 3V3 (via USB: J11 1-2) or Vdd (a coin cell: J11 2-3). No battery is needed when running via the USB-mini-cable.

Remark: For proper battery functionality a small modification should be made. For the details see the workaround in Appendix H.

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3.4.3 Block diagram

This is the schematic of the block diagram; all other schematics can be found in Appendix C.

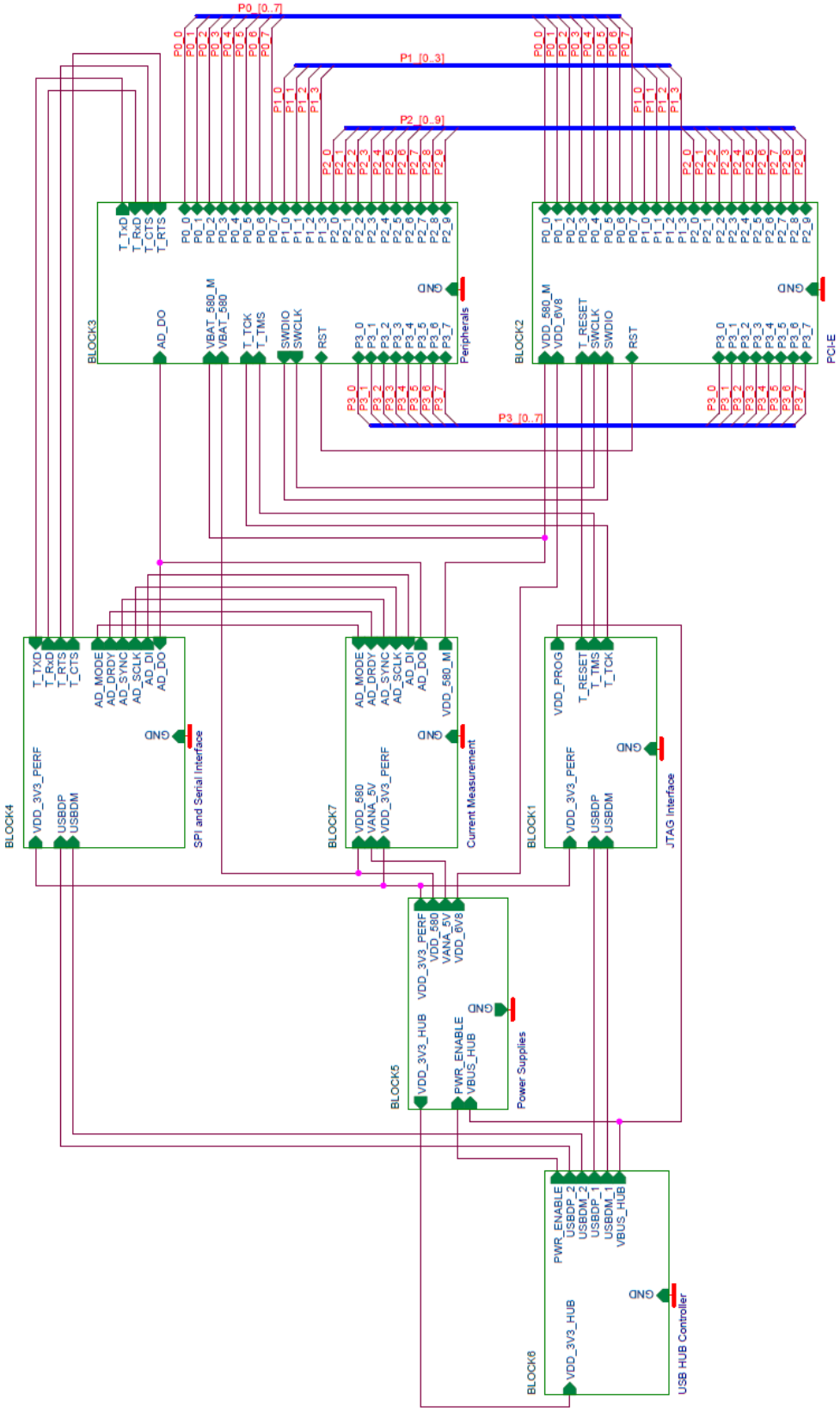

Figure 10: Block diagram of total system

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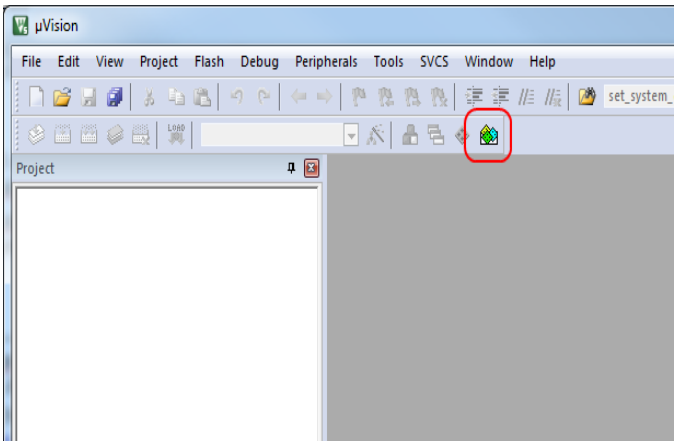
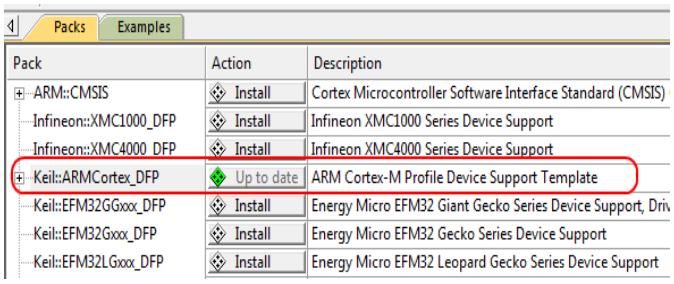
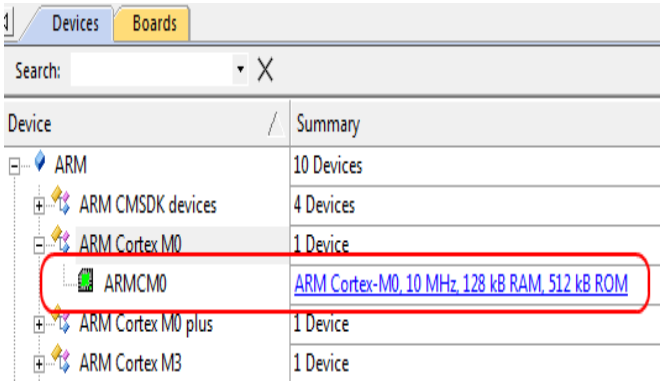
4 Installation of tools and drivers

To install the Software development environment, please follow the steps as shown in Table 6.

Table 6: Installation tools and drivers

4.1 Keil		
4.1.1	Download and install the Keil MDK-ARM uVision IDE. Both uVision ver. 4.0 and ver. 5.0 are supported, but version 5 is preferred.	Keil: https://www.keil.com/download/product/ Keil MDK-ARM Version 5 – Installation: http://www2.keil.com/mdk5/install Starters Guide: http://www.keil.com/uvision/ide_ov_starting.asp
4.1.2	For uVision Version 5 you have to install the ARM Cortex M profile package (see also http://www.keil.com/dd2/Pack/)	
4.1.3	You should see a list of packs as shown on the right. If you do not see this list, please click the “Packs” menu item and select the “Check for Updates” option to download an updated list. Click on the “Install” button to the right of “Keil::ARMCortex_DFP” package.	
4.1.4	If the installation is successful, the pack installer window should look like this.	

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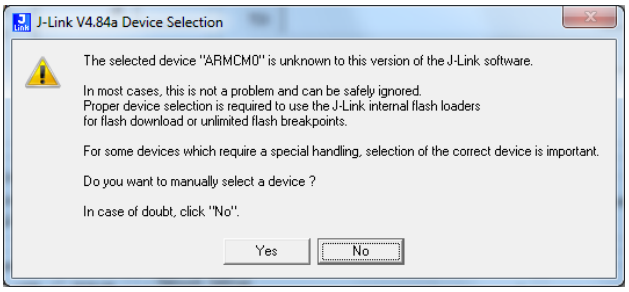
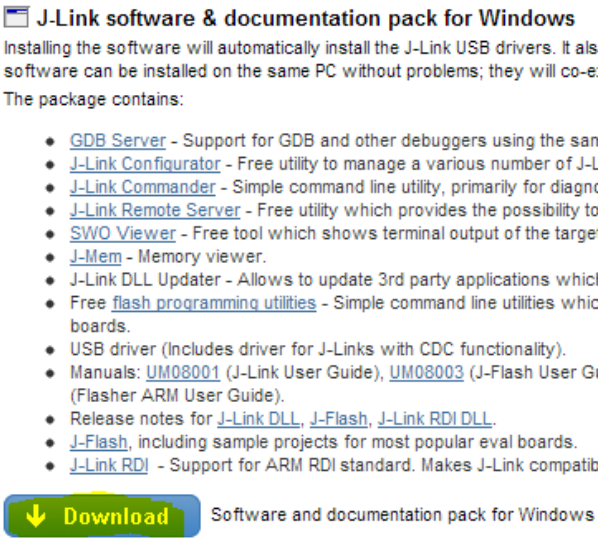
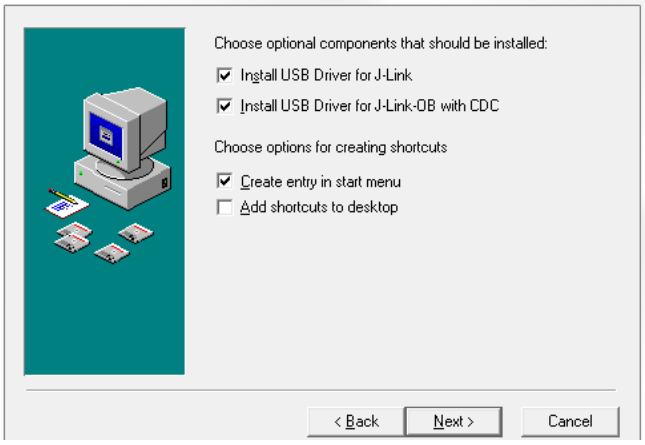
4.1.5	This screen may occur, is so: Select ‘yes’ and in the next window Select ‘M0’.	
4.2	**SEGGER Jlink driver**	
4.2.1	Download and install the Jlink software & documentation pack for Windows. *Please note that your SEGGER Jlink serial number is required for downloading. Use the number on the sticker located on the backside of board.*	 http://www.segger.com/jlink-software.html
4.2.2	In order to for the USB controller to be properly recognized by Windows as a J-Link device, you have to install the driver with the settings shown in the figure on the right.	

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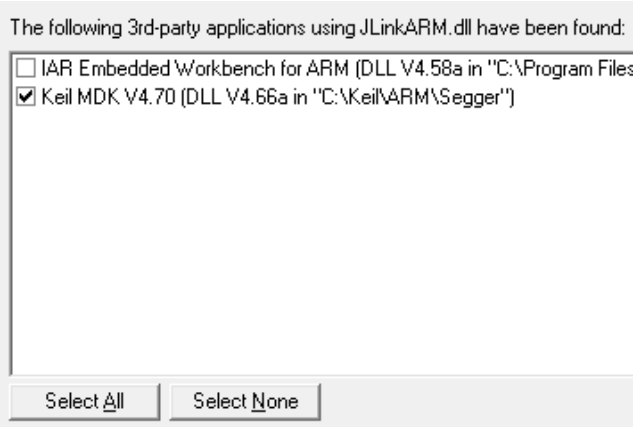
4.2.3	At the end of the installation, please tick the IDE (Keil MDK Vxx) that you are using.	
4.3 FTDI driver		
4.3.1	The Development Kit uses the D2xx driver. For Windows, this driver is part of the Combined Driver Model (CDM) driver. (It is recommended that the latest driver available from the FTDI page is used.) **Latency Timer:** see Appendix F	USB Drivers: http://www.ftdichip.com/Drivers/D2XX.htm Installation Guide: http://www.ftdichip.com/Support/Documents/InstallGuides.htm
4.4 Tera Term		
4.3.1	Download and install Tera Term on your PC.	Tera Term: http://en.sourceforge.jp/projects/ttssh2/releases/

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5 Memory and tools

The DA14580/DA14581DEVKT is equipped with: (on the chip) SRAM (50k) and OTP (32k). Mounted on the board is external SPI flash memory (2Mbit).

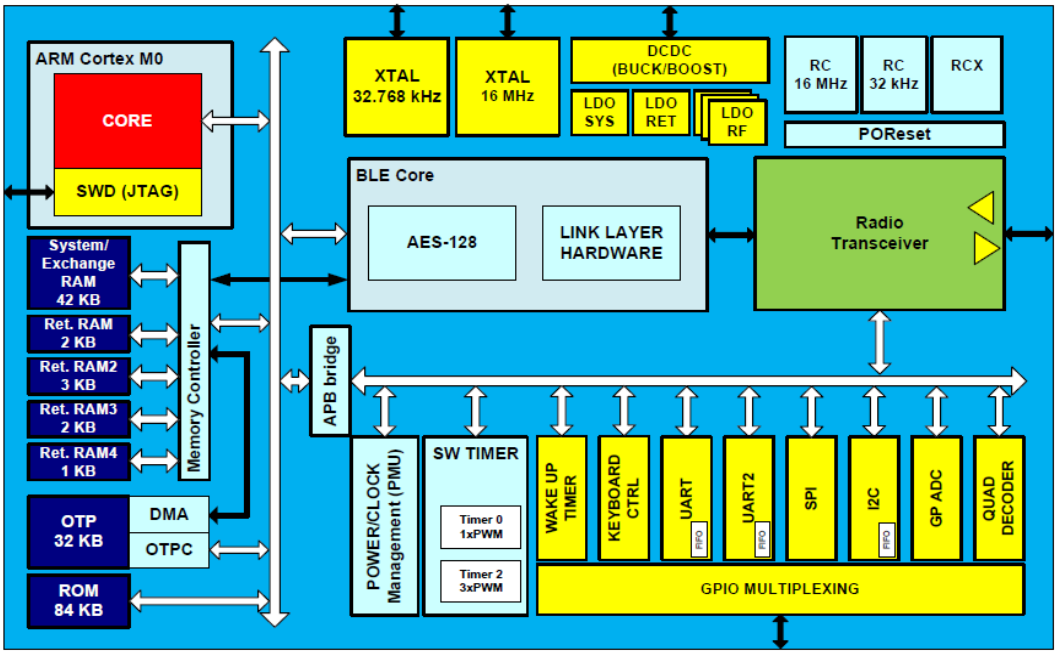

Figure 11: DA14580/581/583 block diagram

Software can be downloaded to:

- SRAM
  - Keil IDE
  - SmartSnippets
  - Command Line Interface (CLI)
  - Connection Manager
- OTP
  - SmartSnippets
  - CLI
- SPI (flash)
  - SmartSnippets
  - CLI

Example: loading software (hex-file) by using SmartSnippets

- PC → UART → DA14580/581/583
- PC → UART → DA14580/581/583→ SPI (flash)
- PC → UART → DA14580/581/583→ OTP

For the settings of the jumpers see Figure 5.

An example of the **CLI** is shown in Appendix D

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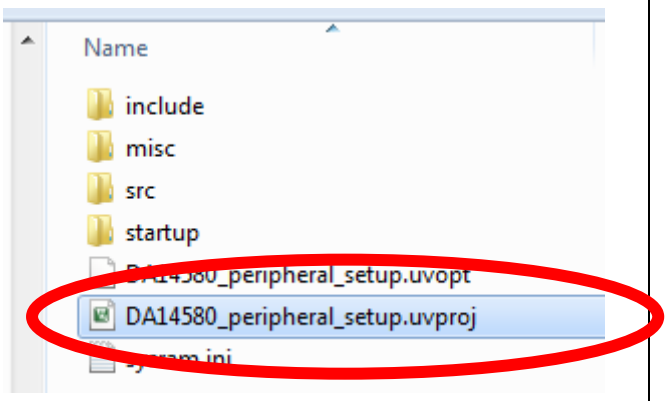
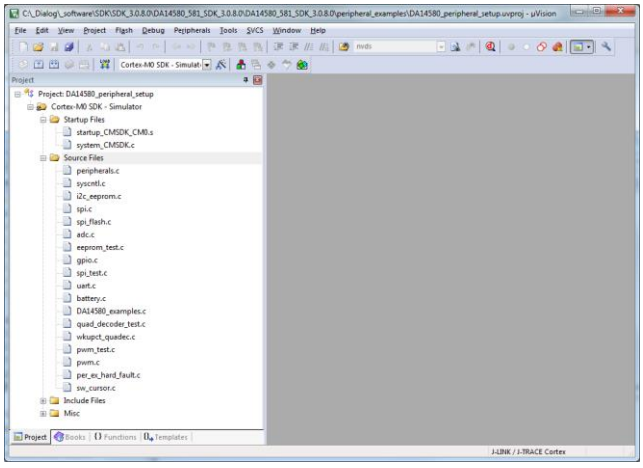
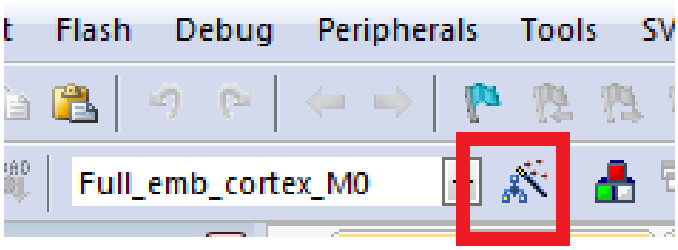
6 Using the demo kit

Follow the steps shown in Table 7 to easily create a working demo kit.

Table 7: Run an example on DA14580/581/583

6.1 Run an example on DA14580/581/583		
6.1.1	After you download the SDK at http://support.dialog-semiconductor.com/software-downloads/index You can find a source code example in example directory called (SDK xxx): "*peripheral_examples\peripheral_setup*". Double click "DA14580_peripheral_setup **.uvproj**", as shown in the image to the right.	
6.1.2	The development environment should look like this when the project is opened with Keil.	
6.1.3	Click on the '**Options for Target**' button.	

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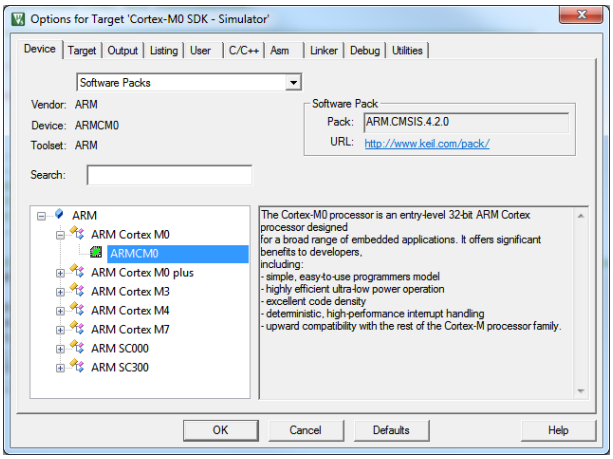
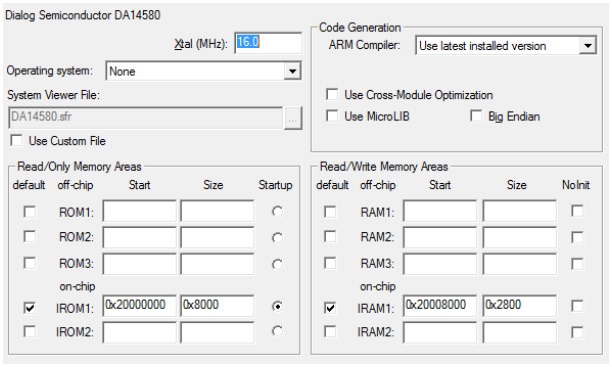
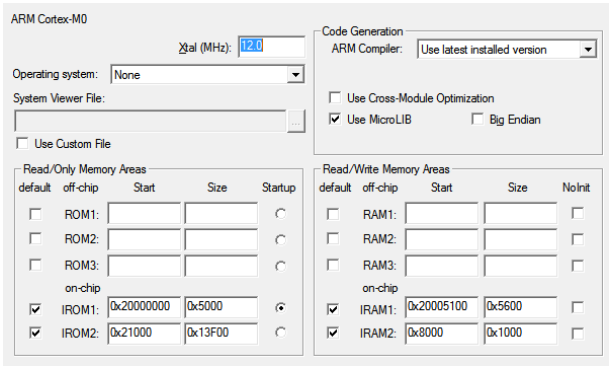
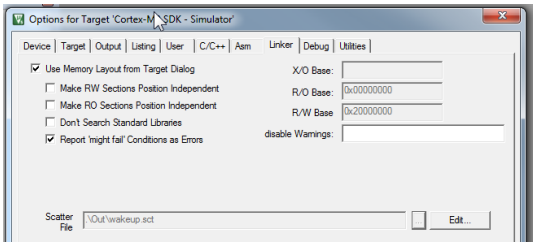
6.1.4	‘Options for Target’ → ‘Device’ -screen should look like this.	
6.1.5	‘Options for Target’ → ‘Target’ - screen looks like this. Mind the ‘Memory’ areas.	580:  581:  scatter file selection in ‘Options for Target’ 

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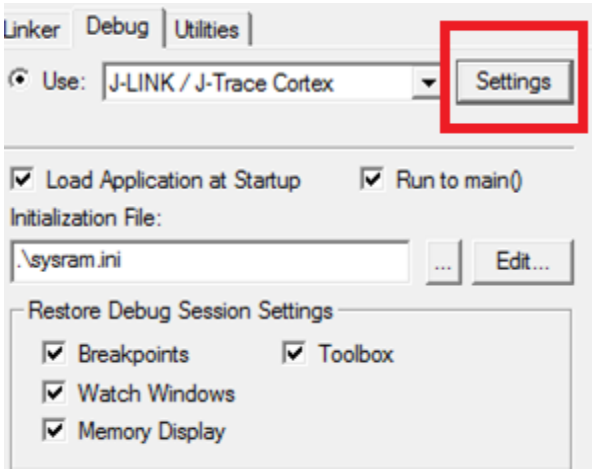
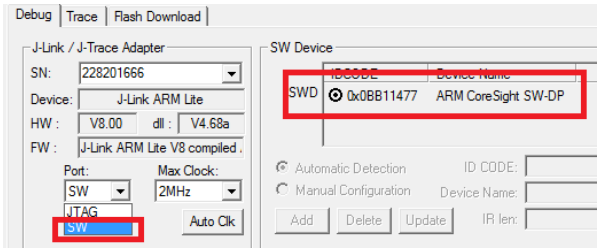
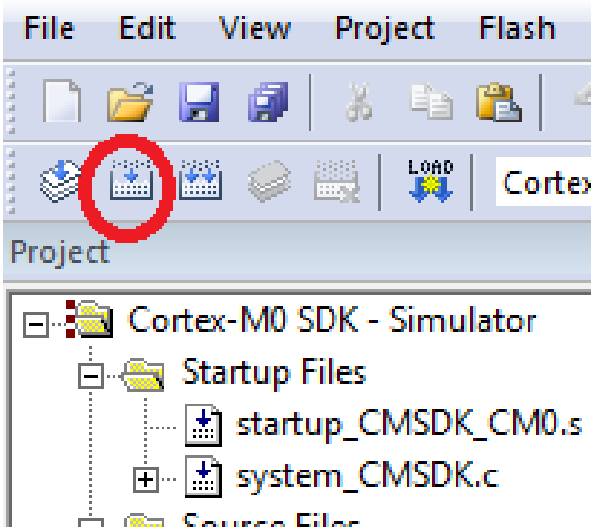
6.1.6	Make sure “J-LINK/J-Trace Cortex” is selected as shown and the initialization file field is set correctly to “.\sysram.ini”.	
6.1.7	Click on the “Setting” button above to make sure the SW Device has been detected correctly. *Important note: Under certain circumstances, uVision IDE may crash upon pressing the “settings” button. A workaround is found in* Appendix E	
6.1.8	Click “OK” to save the settings.	All settings have been saved properly now, and you can continue to build the example.
6.1.9	Build the project by pressing “F7” key, or click the build button as shown in following picture	
6.1.10	Make sure you have a UART connection between your PC and a mother board, as shown in 6.1.5. Check the “COM” number on you PC.	Go to the Windows Control Panel →Administrative Tools →Computer Management → Device Manager → Ports → USB Serial Port # (connect or disconnect to see the COM port of that module)
6.1.11	Open the Tera Term serial terminal on you PC.	

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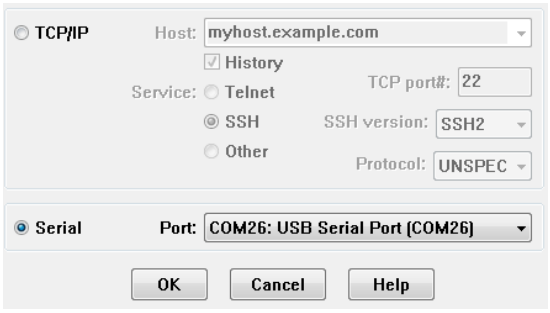
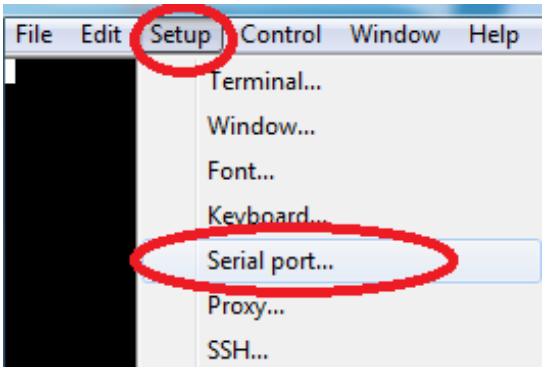
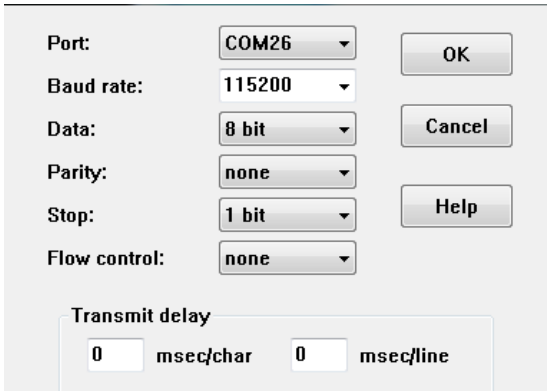
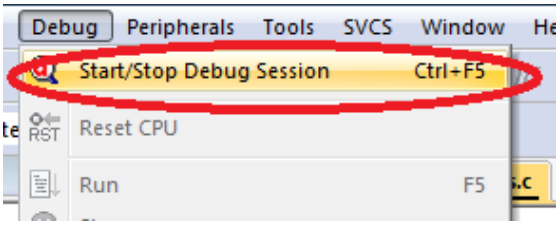
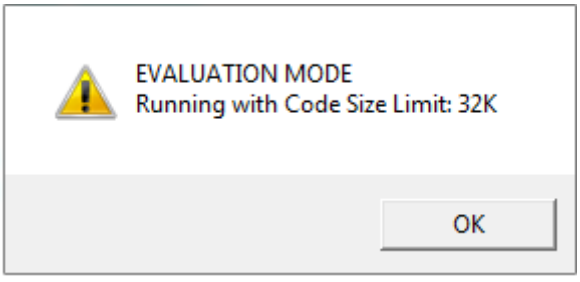
6.1.12	Open Tera Term and choose a COM port, which you have found in step 3, and click OK	
6.1.13	Choose Setup->Serial port to configure the Baud rate etc.	
6.1.14	Set “Baud rate” to 115200, ”Data” to 8 bit, ”Parity” to None, ”Stop” to 1 bit and “Flow control” to none. Click OK. Now we have a properly configured UART terminal on our PC.	
6.1.15	Go back to Keil Project. In the menu bar, select Debug->Start/Stop Debug Session.	
6.1.16	A dialog window pops up, like the one on the right. Please click “OK”.	

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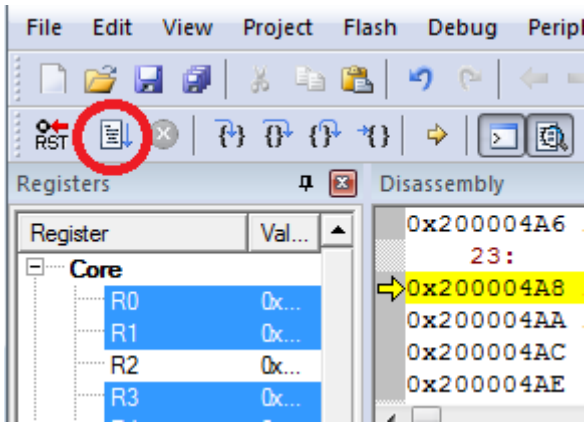
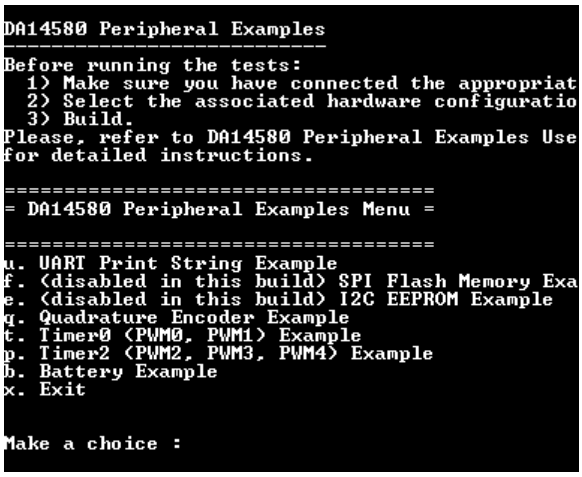
6.1.17	Press F5 key or click execution button as shown in following picture, to start code execution.	
6.1.18	Then you can see a *hello* message on your UART terminal screen. That means you have successfully programmed and started the peripheral program on DA14580/581/583 demo board. The *peripheral_setup* demo consists of a small suite of tests that encompasses some of the most commonly used peripherals such as I2C EEPROM, SPI Flash, Rotary Encoder, audio buzzer etc. For more detailed info and technical details please refer to the *UM-B-005: DA14580/581/583Peripheral Examples* as well as the source code of the *peripheral_setup* demo. Remark: this software is originally written for the 'SmartBond™ DA14580/581/583-- Development Kit – Expert'. See: http://support.dialog-semiconductor.com/resources	

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Appendix A Layout

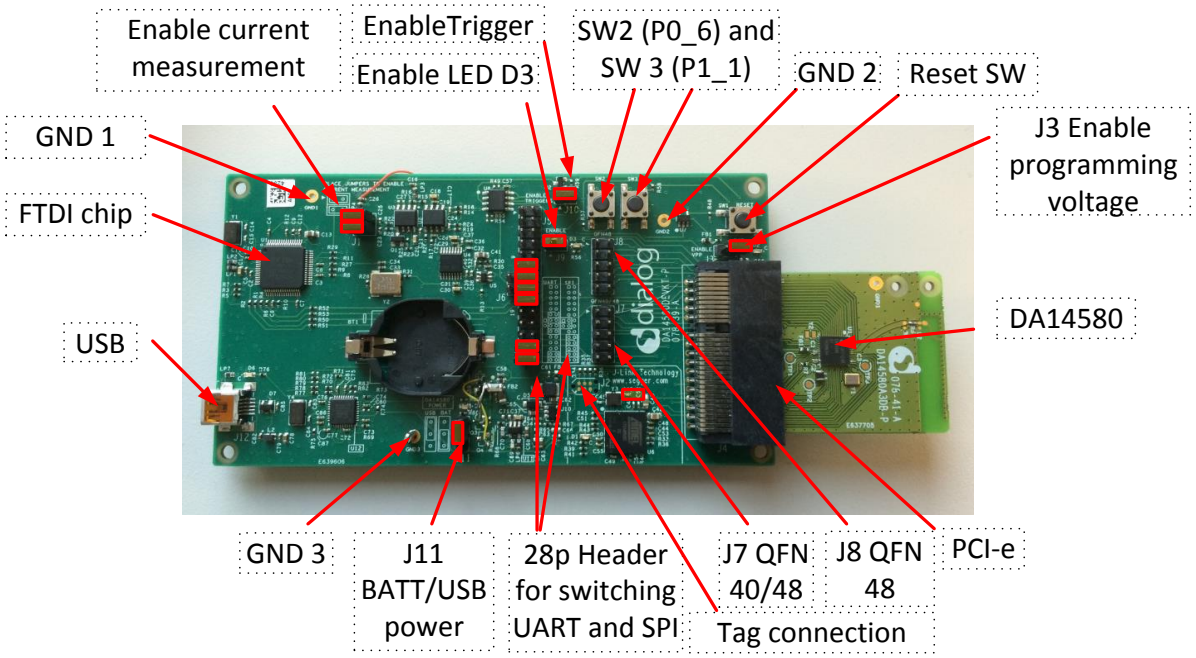

Figure 12: **Board layout**

Appendix B Connections of J7 and J8

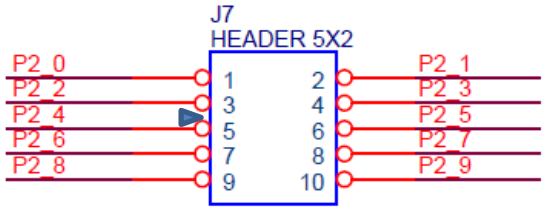

Figure 13: IO breakout available on QFN40 and QFN48

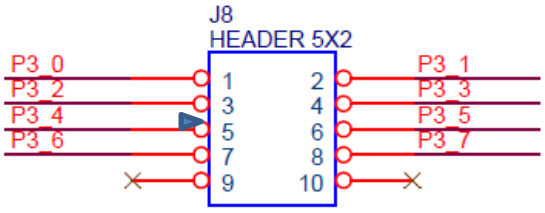

Figure 14: IO breakout available on QFN48

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Appendix C Schematics Motherboard and Daughterboards

C.1 Peripherals

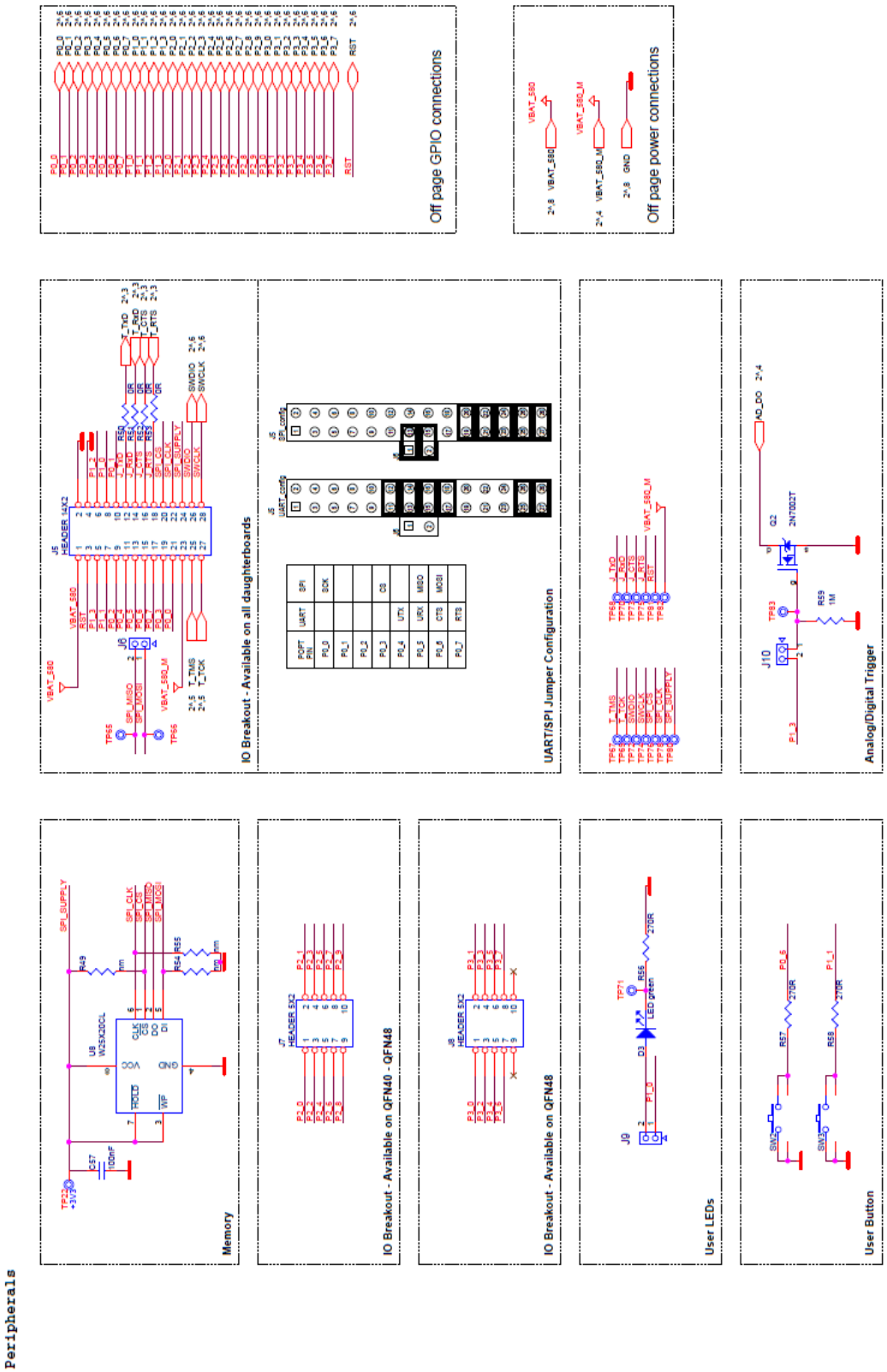

Figure 15: Peripherals schematic of Motherboard

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C.2 SPI and serial

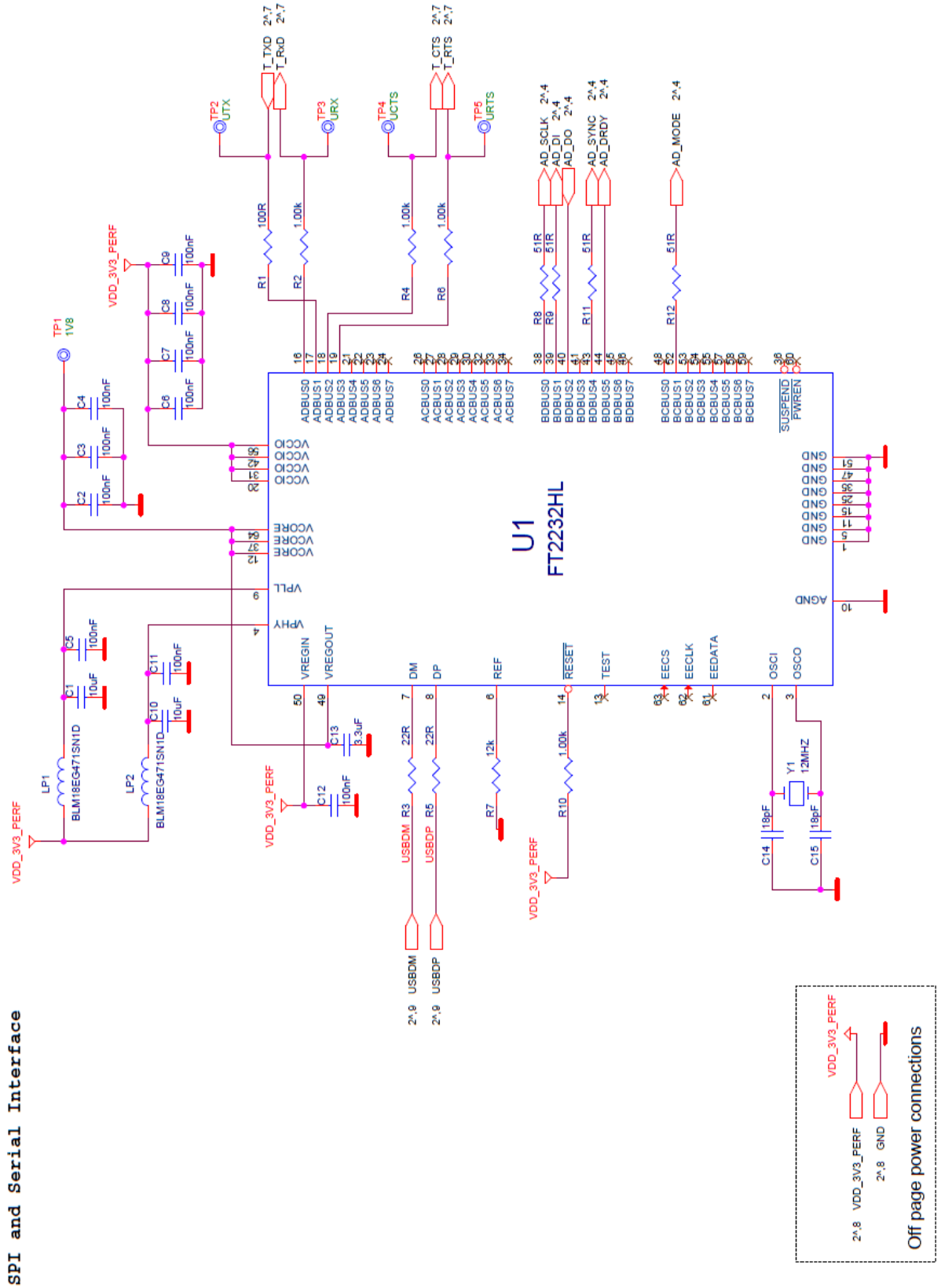

Figure 16: SPI and serial schematic of Motherboard

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C.3 Current measurement

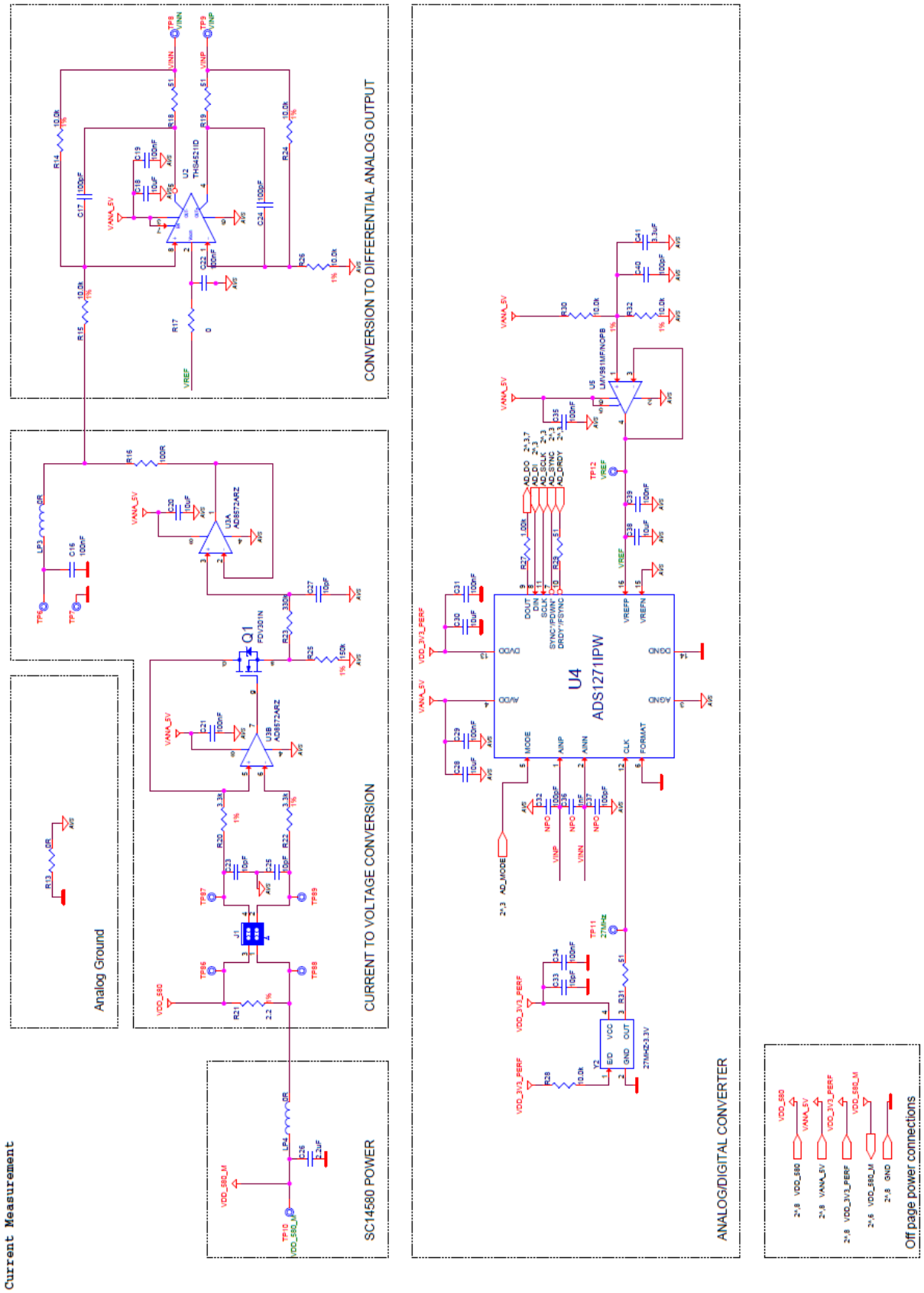

Figure 17: Current measurement schematic of Motherboard

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C.4 JTAG Interface

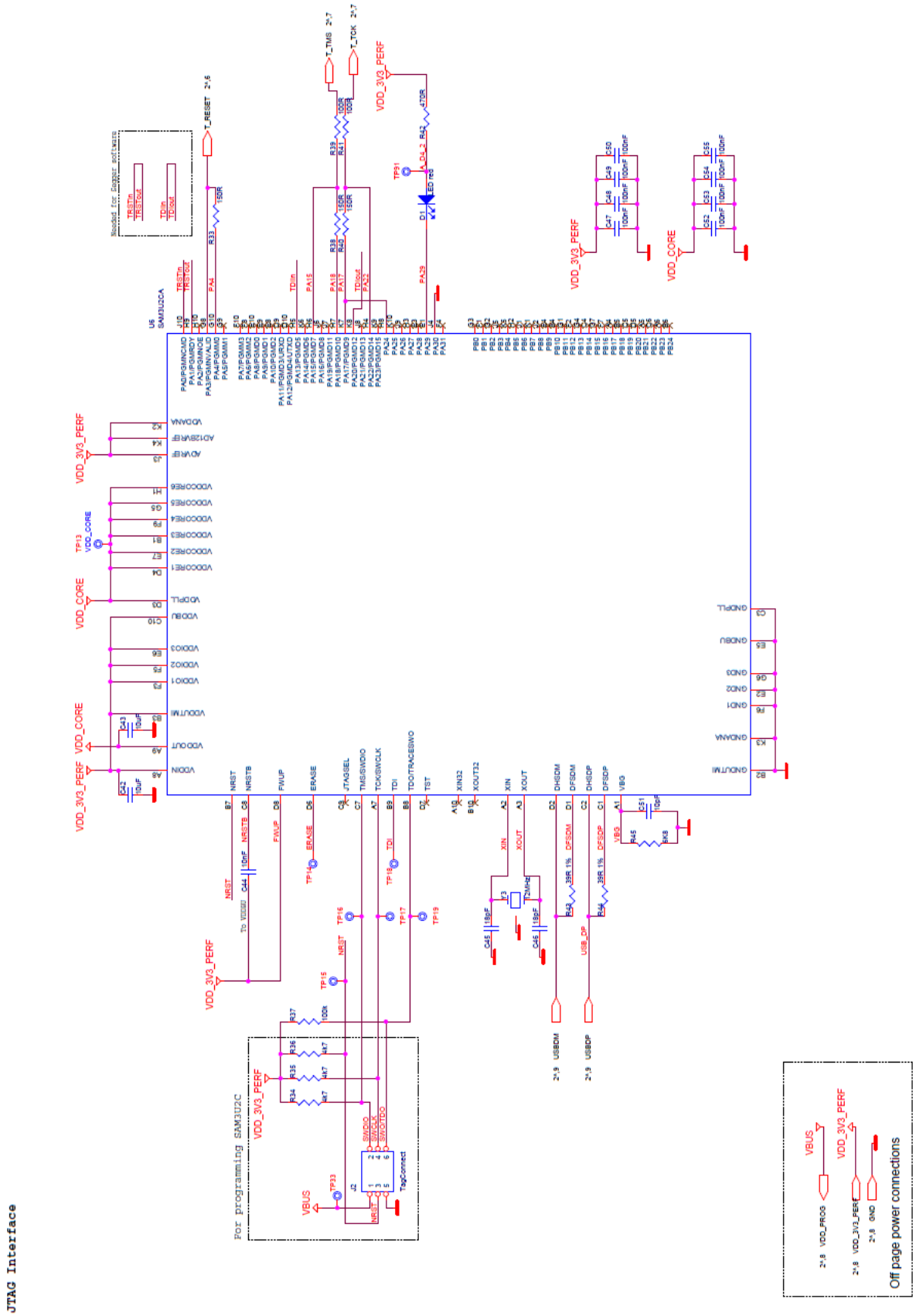

Figure 18: JTAG interface schematic of Motherboard

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C.5 PCI-e

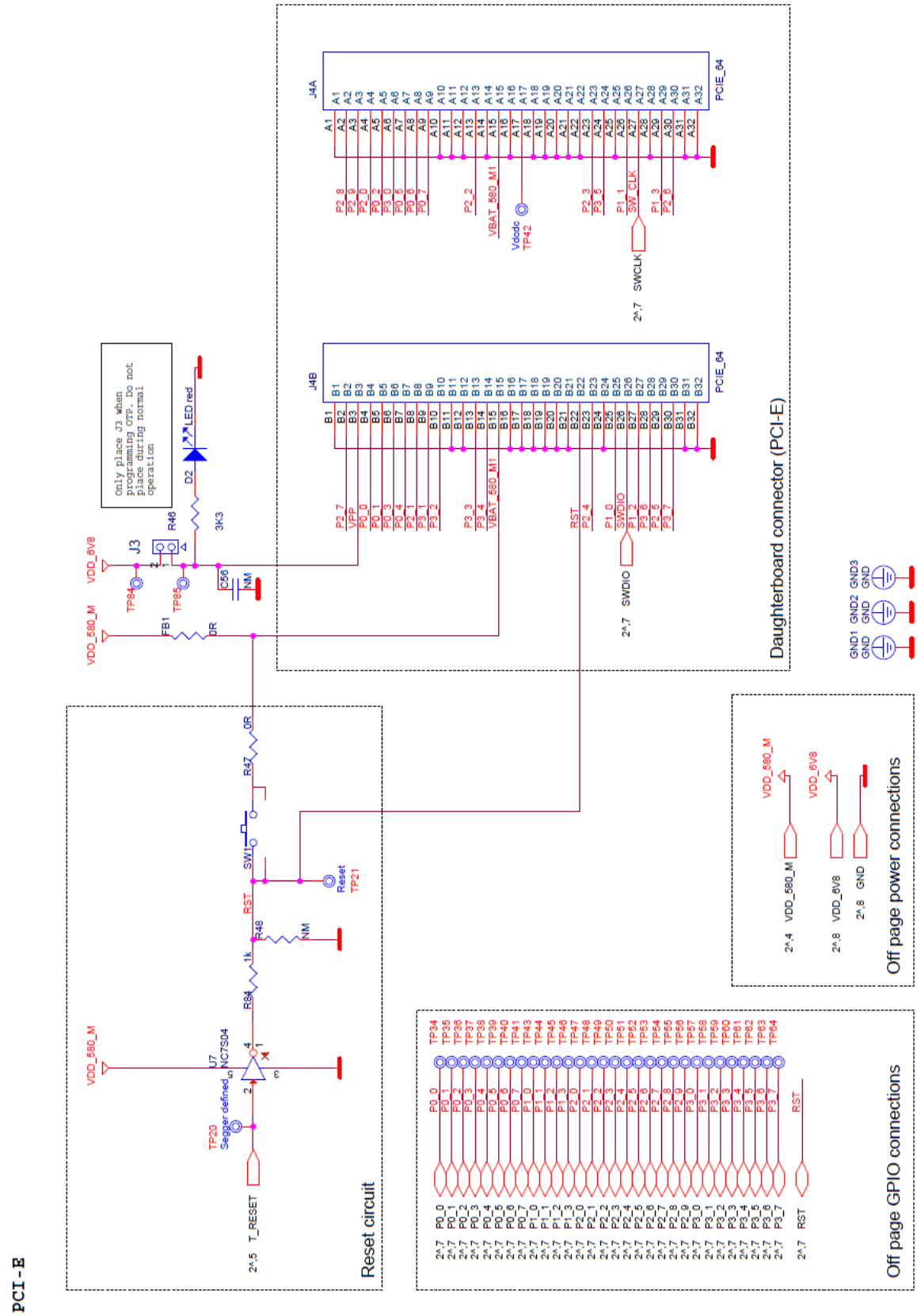

Figure 19: PCI-e schematic of Motherboard

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C.6 Power supplies

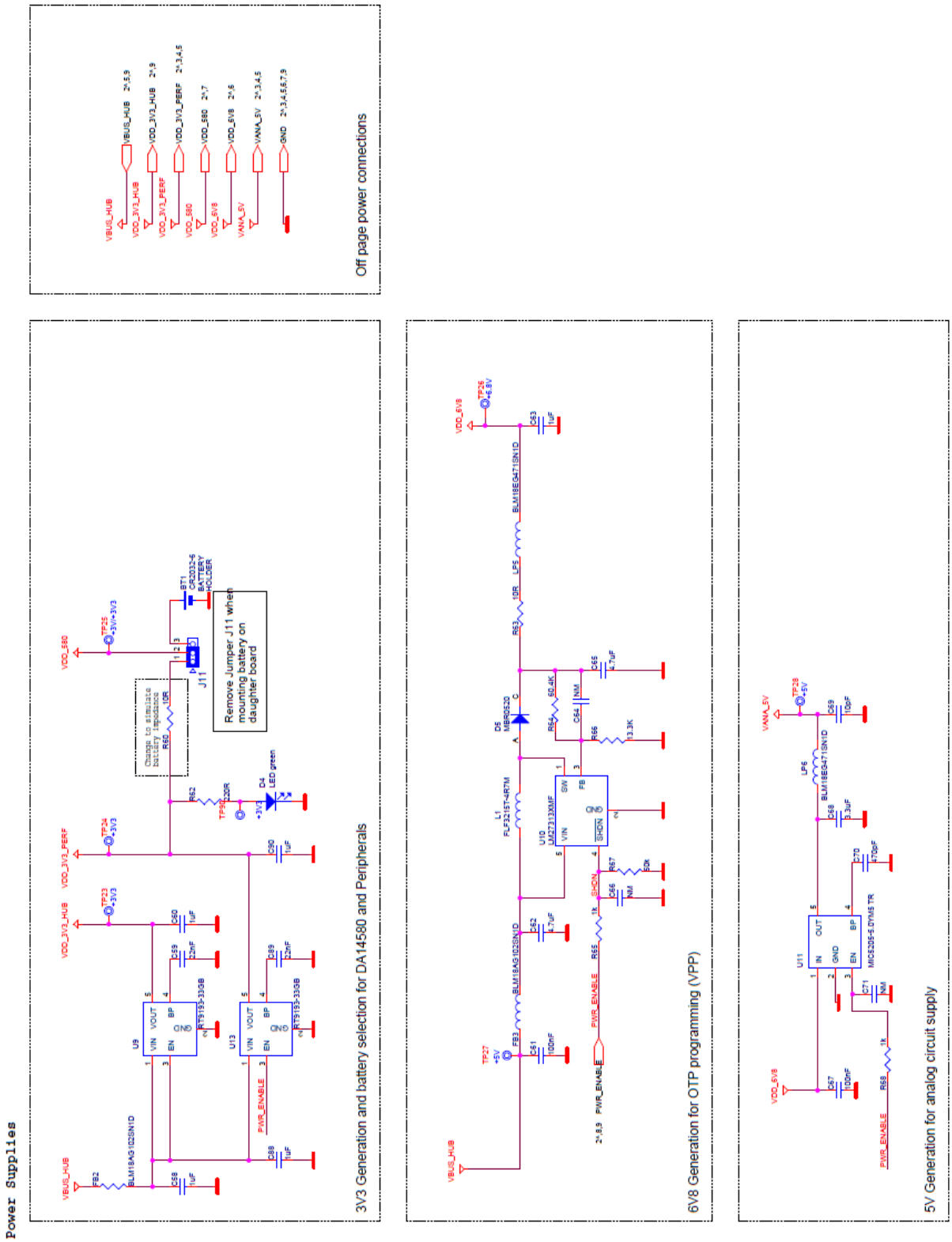

Figure 20: Power supplies schematics of Motherboard

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C.7 USB HUB Controller

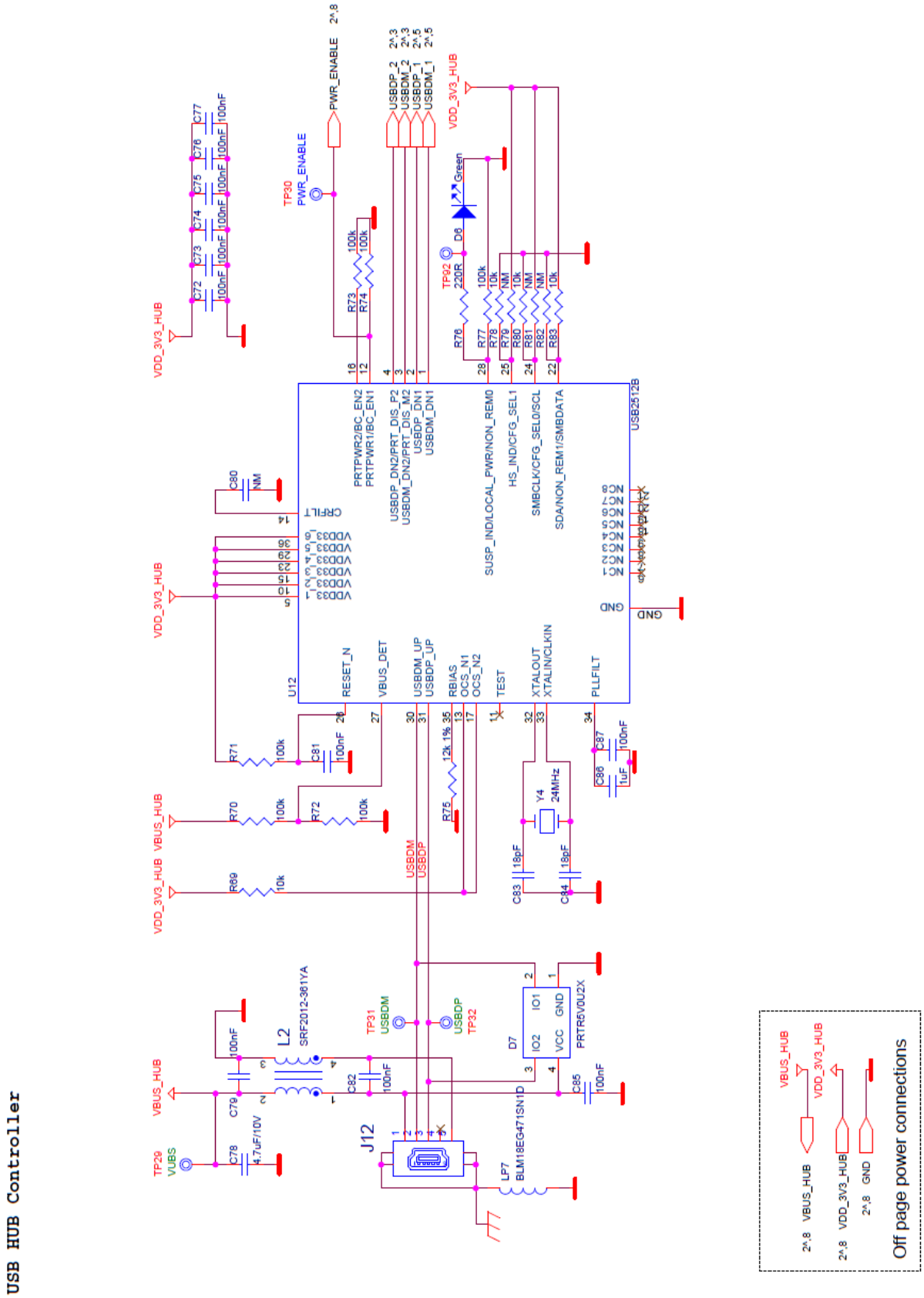

Figure 21: USB HUB controller schematic of Motherboard

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C.8 DA14580 WLCSP Daughter board

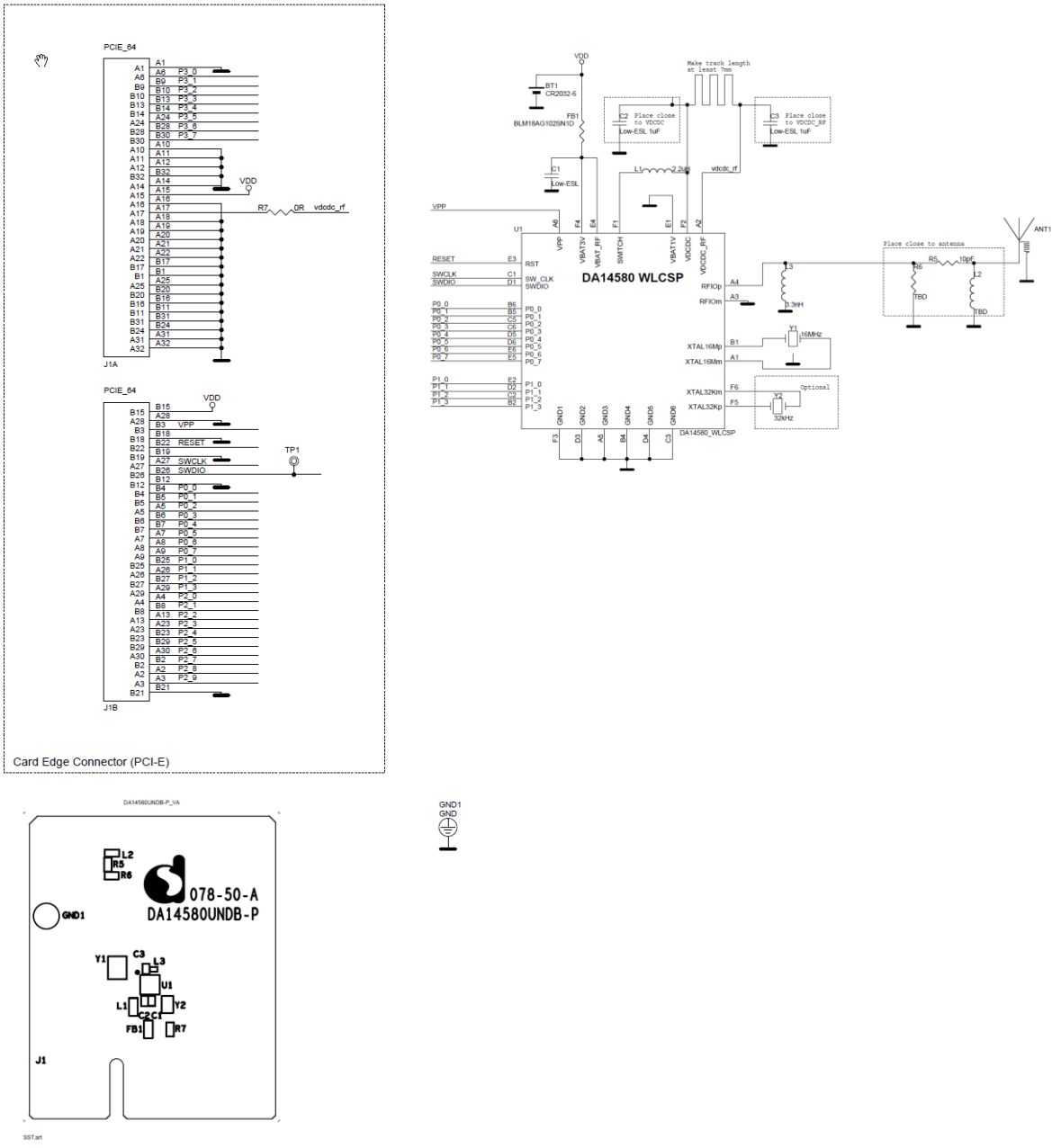

Figure 22: DA14580 WLCSP Daughter board

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C.9 DA14580 QFN40 Daughterboard

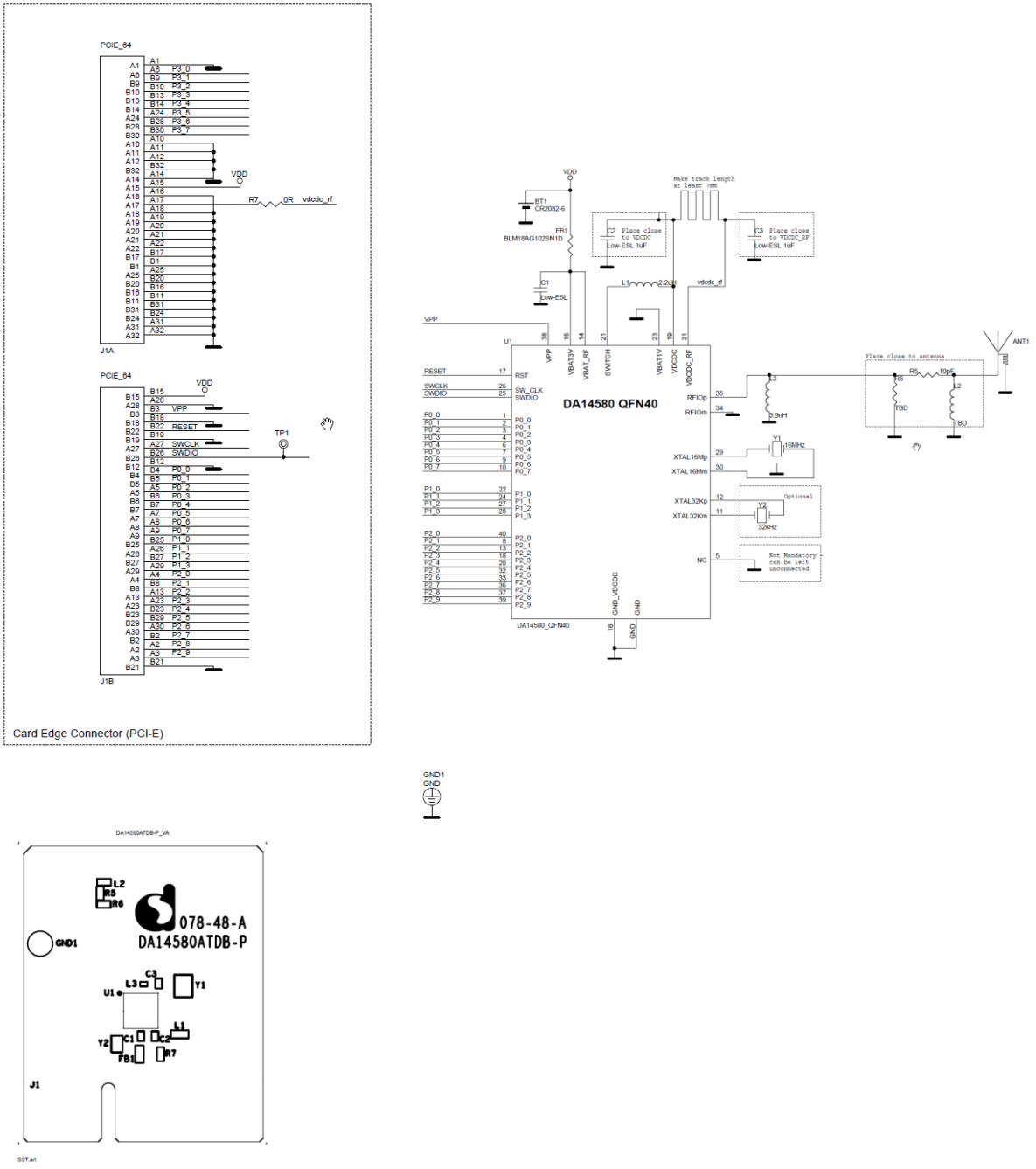

Figure 23: DA14580 QFN40 Daughterboard

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C.10 DA14580 QFN48 Daughterboard

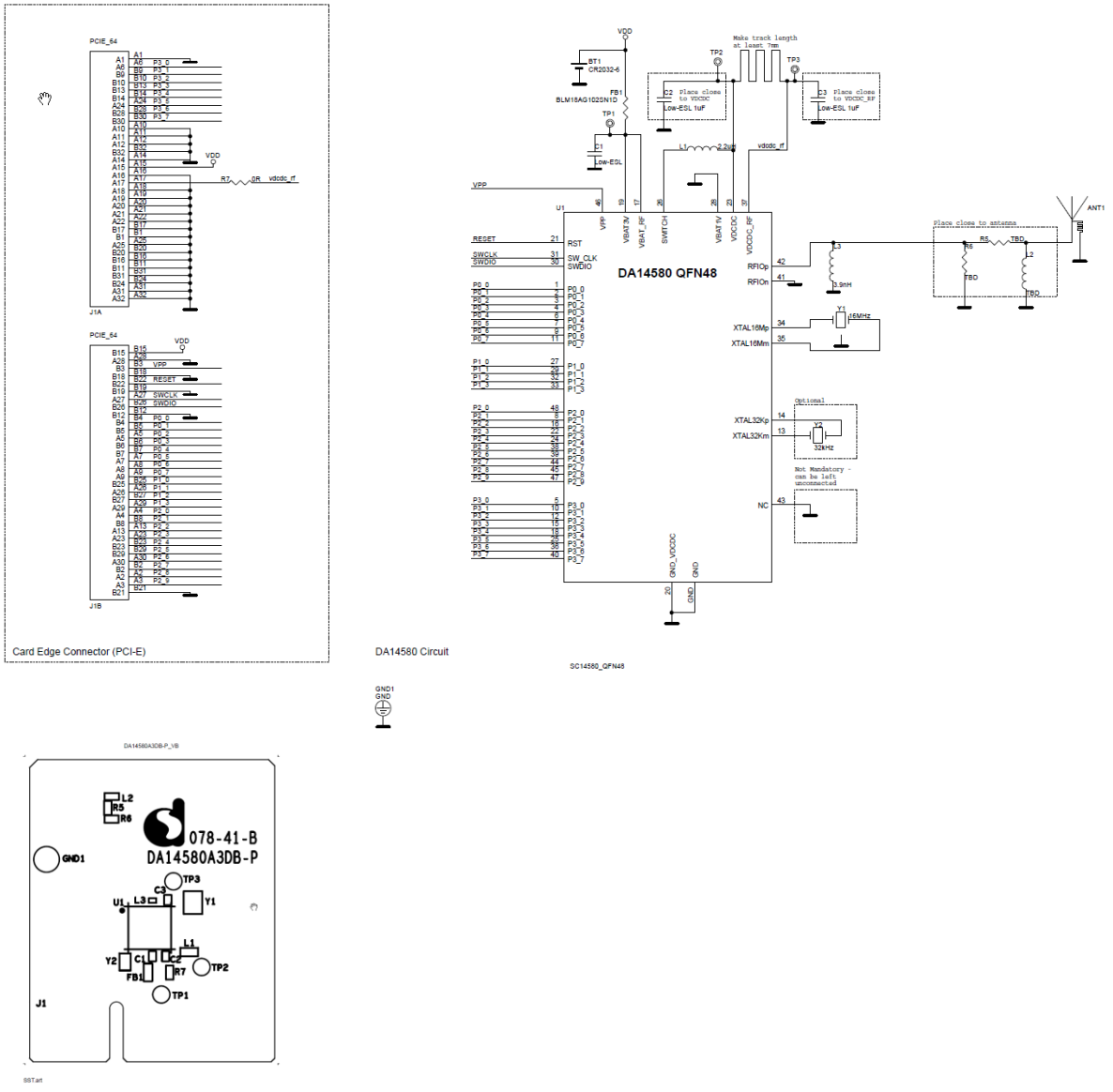

Figure 24: DA14580 QFN48 Daughterboard

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C.11 DA14581 WLCSP Daughterboard

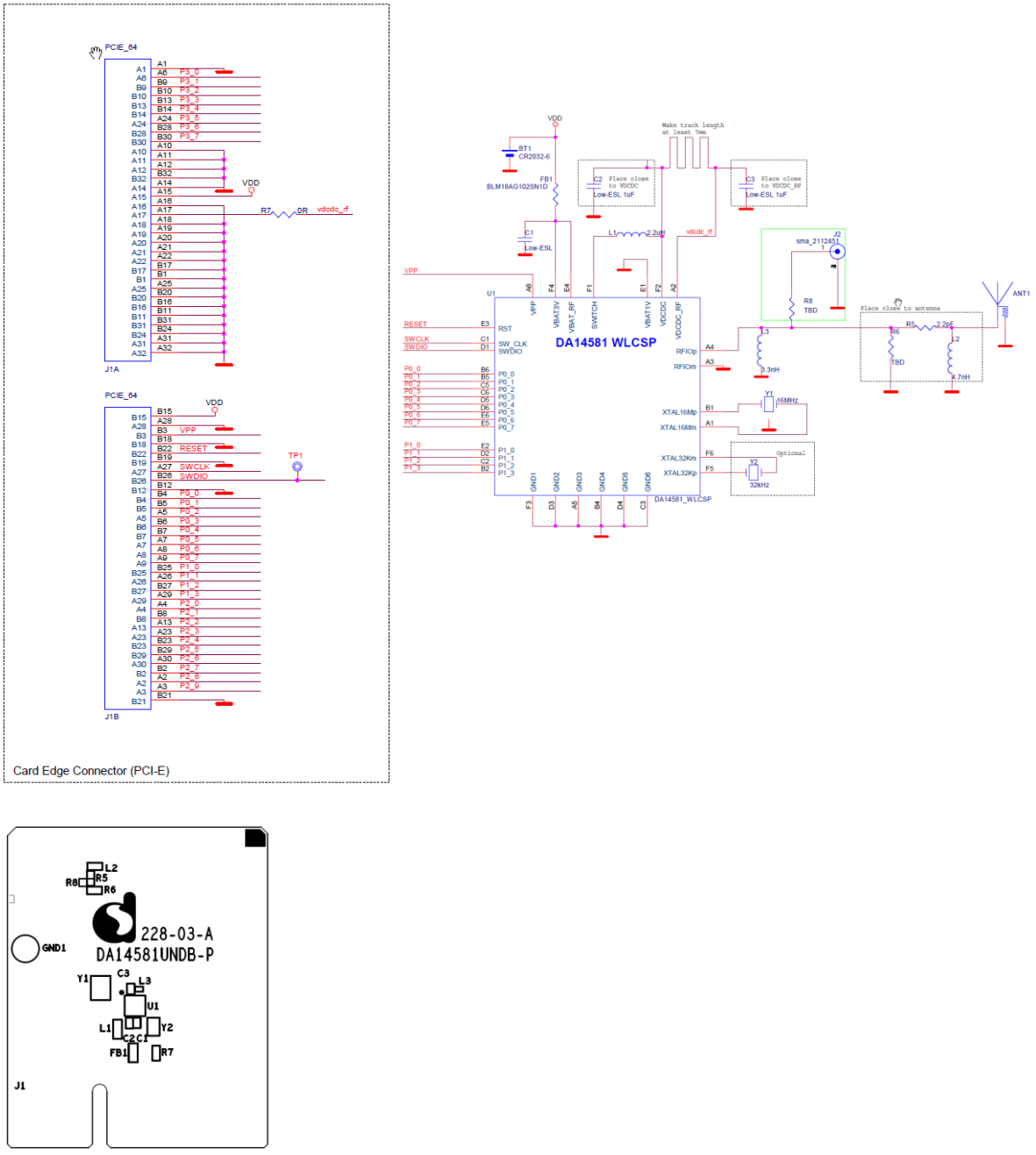

Figure 25: DA14581 WLCSP Daughterboard

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C.12 DA14581 QFN40 Daughterboard

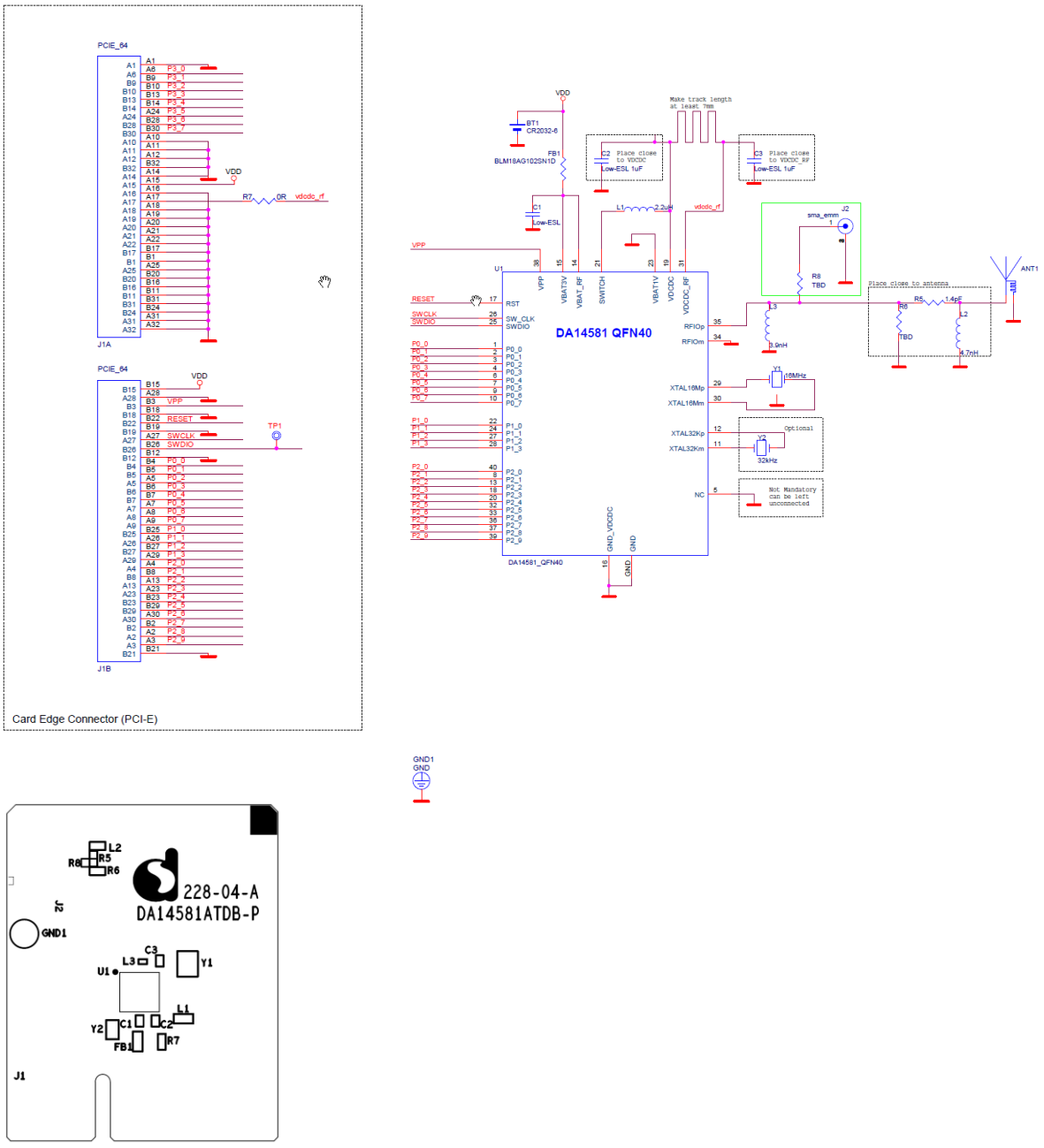

Figure 26: DA14581 QFN40 Daughterboard

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C.13 DA14583 QFN40 Daughterboard

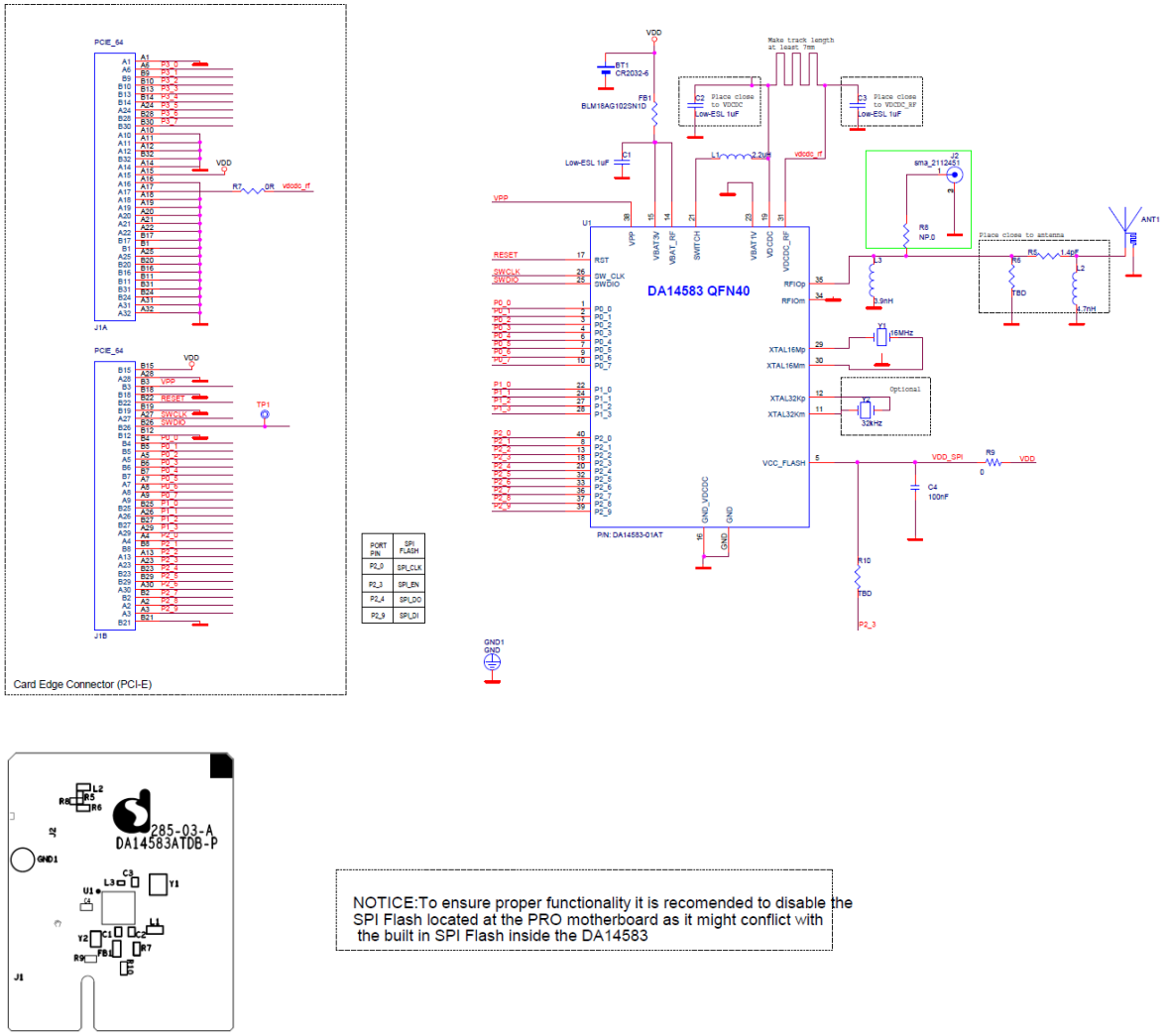

Figure 27: DA14583 QFN40 Daughterboard

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Appendix D Using the SmartSnippets CLI

All the information/syntaxes about the CLI can be found from the **HELP** tab in the SmartSnippets GUI or by written **Smartsnippets –help** in the CLI.
In this example, it is supposed that the SPI memory is using P0_0 as SCK, P0_3 as CS, P0_5 as MISO and P0_6 as MOSI.

First of all, the CLI can send the commands either via UART or JTAG according to the binary file which has to be loaded.

On the one hand, if the commands are going to be sent via UART, the following binary file which can be found from the resources folder of SmartSnippets has to be downloaded into the DA14580/DA14581:

- *flash_programmer.bin*

On the other hand, if the commands are going to be sent via JTAG, the following binary file which can be found from the resources folder of SmartSnippets has to be downloaded into the DA14580/DA14581:

- *jtag_programmer.bin*

Secondly, open the CLI by pushing the Shift button and right click on the **'bin'** folder of the SmartSnippet and select '**Open command window here'** as follow:

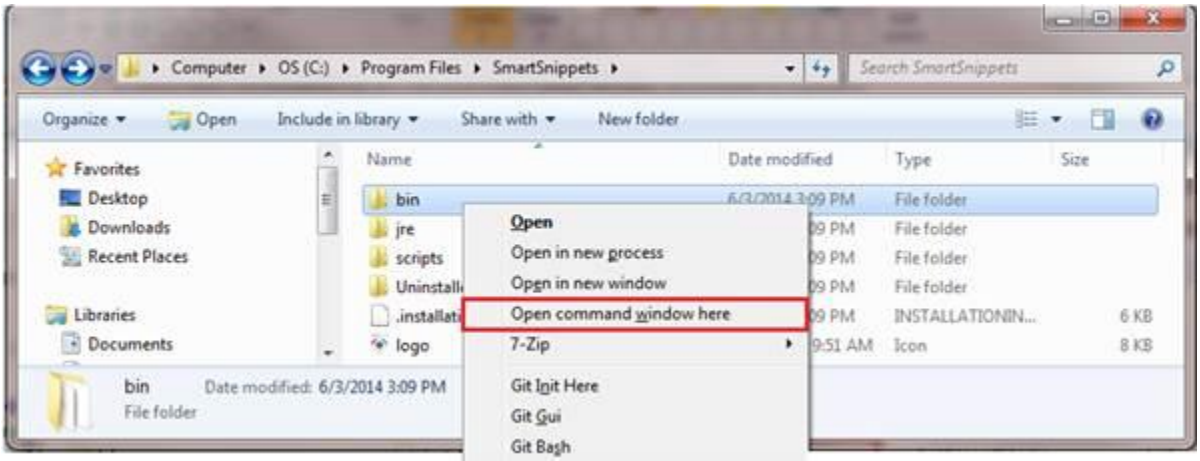

Figure 28: Open the CLI of SmartSnippets

Finally, in order to write a value 0x1347 (example of a bluetooth device address) at the address 0x93 for instance, the following command line can be written:

SmartSnippets.exe -type spi -chip DA14580/DA14581-01 -jtag 228202458 -cmd write_field -offset 0x93 -data 1347 -firmware "D:\SmartSnippets\resources\jtag_programmer.bin"

The answers should be as shown below:

```
Found SWD-DP with ID 0x0BB11477
FPUnit: 4 code (BP) slots and 0 literal slots
Found Cortex-M0 r0p0, Little endian.
BTLE device DA14580 selected.
Using default GPIO pin Id: P1_2.
File c:\users\glagnieu\smartsnippets\ressources\jtag_programmer.bin could not been found.
Using default baudrate: 57600 Bd.
Burned 2 bytes to address 0x00093.
```

Figure 29: Smart snippet CMD window

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Appendix E Opening your project for the first time

Issue description

When, on a Keil uVision project, some entries in file .uvopt is missing or the file is missing, then, when the user clicks on the button 'settings' (options{debug tag}) with the{J-LINK/J-TRACE Cortex} selected, uVision crashes.

Possible causes

Some important information concerning the j-link driver is missing. Calling the driver's dll probably causes the crash.

Versions of Keil uVision found to be affected

At least versions 5.11.1.0 and 5.10.0.2 are affected.

Under which circumstances user will encounter this error

When a local GIT repository is first created, this file (.uvopt) does not exist, since it is not included in the remote repository. When the user opens the project for the first time, this file is created, but some keys/values are missing.

A proposed solution:

1) Ensure that the .uvopt file does not exist in the folder of your project. If it exists and crash has been identified to happen, delete the .uvopt file.
2) Open the Keil project and close it. The .uvopt file is created automatically in the project folder (where the .uvproj is located).
3) Open the .uvopt file, using your favourite text editor.
4) Under the key <TargetOption> add the flowing lines:

```
<TargetDriverDllRegistry>
<SetRegEntry>
<Number>0</Number>
<Key>JL2CM3</Key>
<Name>-U228202424 -O78 -S0 -A0 -C0 -JU1 -JI127.0.0.1 -JP0 -RST0 -N00("ARM
CoreSight SW-DP") -D00(0BB11477) -L00(0) -TO18 -TC10000000 -TP21 -TDS8007 -TDT0 -
TDC1F -TIEFFFFFFFF -TIP8 -TB1 -TFE0 -FO7 -FD20000000 -FC800 -FN0</Name>
</SetRegEntry>
</TargetDriverDllRegistry>
```

5) Save the .uvopt file and close the text editor.
6) Open the Keil project in uVision.
7) Click on *Project→Options for Project 'XXX'.*
8) On the 'Debug' Tab, select J-Link / J-TRACE Cortex debugger and click on the 'Settings' button for the debugger (not the simulator). This is the instance where the crash would happen.
9) The 'Cortex JLink/JTrace Target Driver Setup' Dialog opens. *Select your debugger as normally.*
10) Close the dialog windows clicking ok.
11) *Now, normal operation of j-link debugger is resumed.* After you have finished your work, close the Keil uVision IDE to allow for updates to the *.uvopt file to be saved.*

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Appendix F Latency Timer of FTDI cable

If an external FTDI cable is used to burn the OTP (or to download the image into the external memory), the Latency Timer of the FTDI cable has to be changed from 15ms to <10ms.
To change the Latency Timer:
Device Manager → COM port → Right click on the COM port chosen → Properties → Port Settings → Advanced → Latency Timer: set it <10ms.

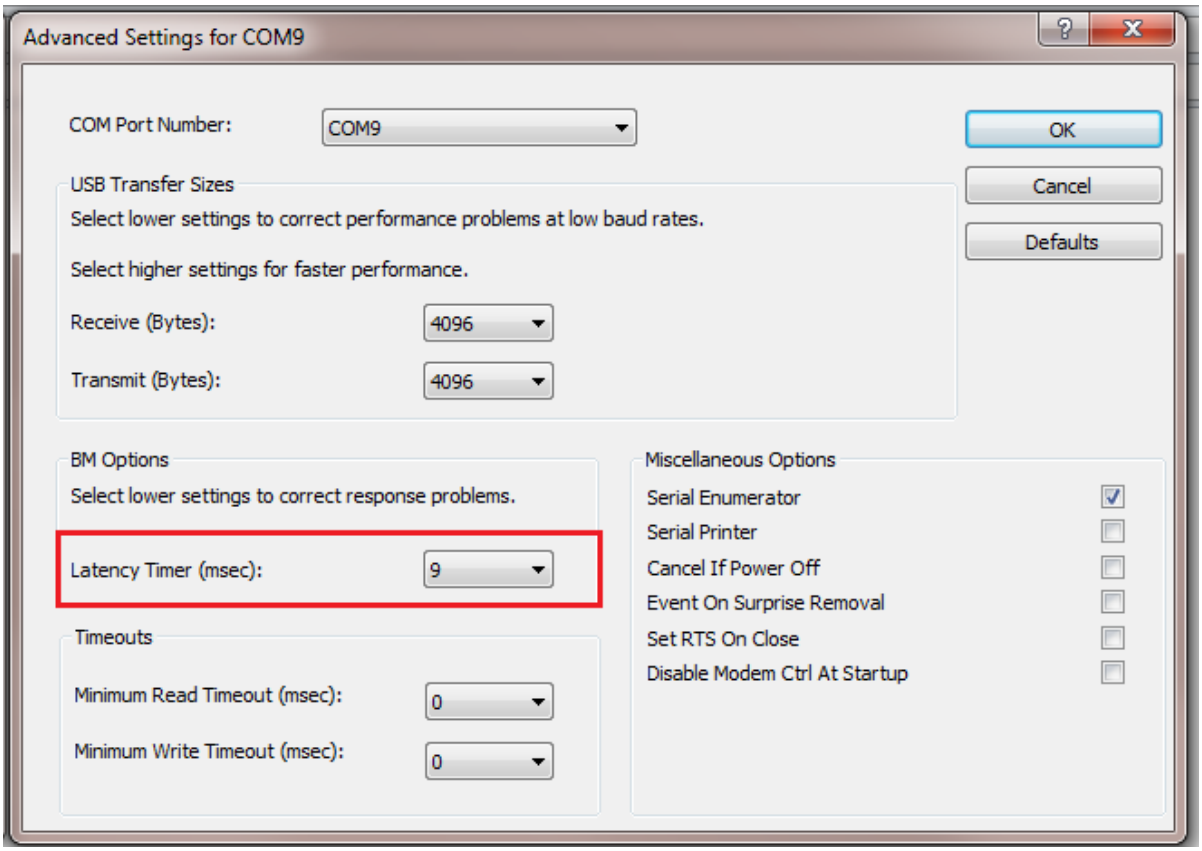

Figure 30: FTDI Latency Timer

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Appendix G RF-Testing DEVKT - Pro

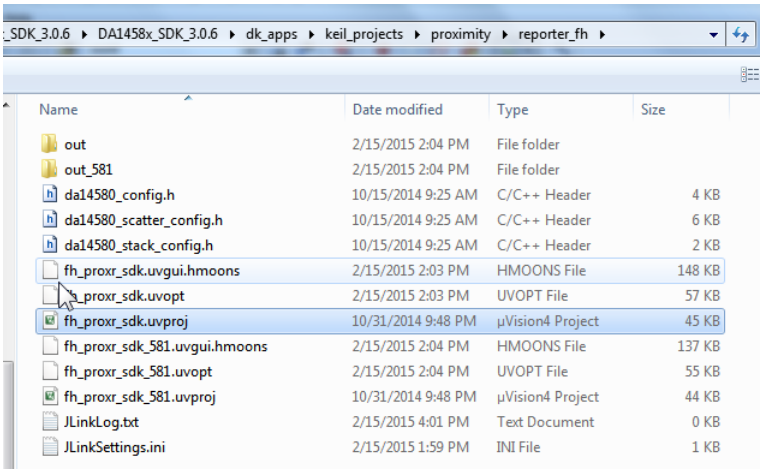
Follow steps to start example from SDK:

- Step 0. connect DEVKT- Pro to USB-port.

- Step 1a. for DA14580: start KEIL via double click on project name:
  … dk_apps\keil_projects\proximity\prox_reporter \prox_reporter.uvproj

or

- step 1b. for DA14581: start KEIL via double click on SDK 3.0.6. object name:
  … DA1458x_SDK_3.0.6\DA1458x_SDK_3.0.6\dk_apps\keil_projects\proximity\prox_reporter \
  prox_reporter _581.uvproj



- Step 2. #define HW_CONFIG_PRO_DK // Pro DK
  see: DA14580_config.h

```
99  /*
100  * HW configuration
101  */
102 //#define HW_CONFIG_BASIC_DK  // Basic DK (DA14580DEVKT-B)
103 #define HW_CONFIG_PRO_DK    // Pro DK (DA14580DEVKT-P)
104
105 #endif // DA14580_CONFIG_H_
106
```

- Step 3. KEIL is started and press F7 for ‘Building‘ the software.
  When the build-result is ‘no errors’, then got the next step.

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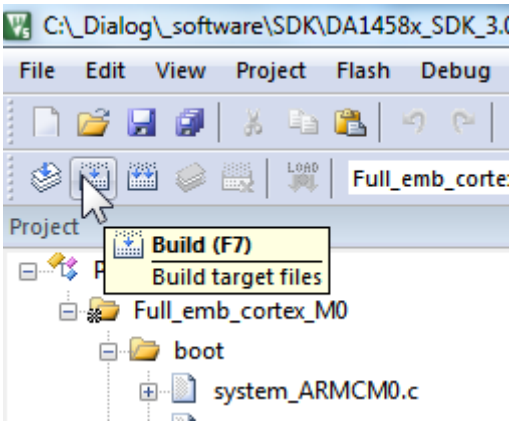
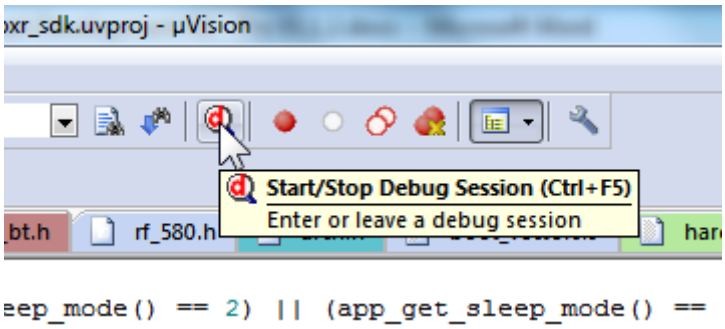
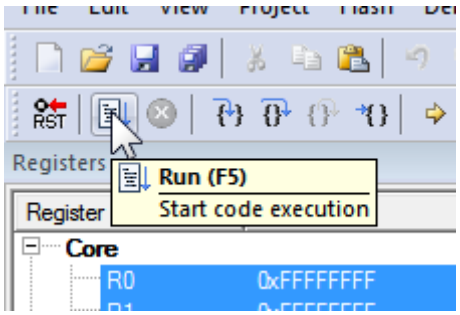


- Step 4. Start Debug Session (Ctrl + F5)



- Step 5. Run the software by pressing ‘F5’



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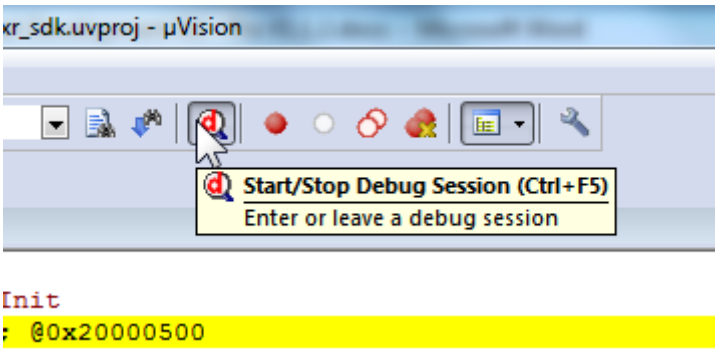
- Step 6. Stop Debug Session by pressing ‘Ctrl + F5’
  Software will start running now!



- Step 7. Check via ‘Bluetooth scanning software’ whether the RF-part of the DEVKT - Pro is working.
  This software is available for iPhone and Android phone as an App.

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Appendix H Battery connection ‘workaround’

There is a small hardware malfunction. When the board operates on battery (J11 jumper on 2-3), the RST-signal is permanently high. When USB is disconnected, then T_RESET becomes low. After invertor U7 RST is high. In this case the board will not operate.

Workaround is the dismounting of R84.

In Figure 31 the Reset circuitry is shown.

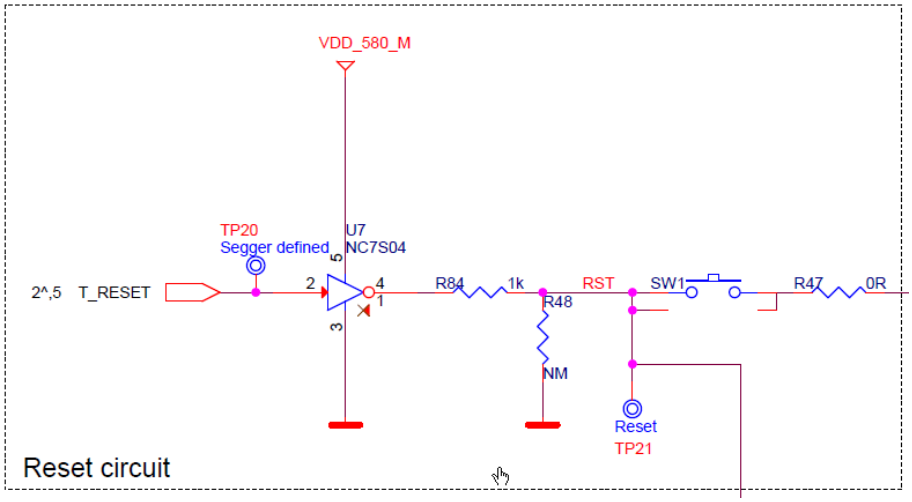

Figure 31: Reset circuitry. R84 to be dismounted.

In a DEVKT – Pro update the hardware problem will be solved.

In Figure 32 the location of R84 is shown.

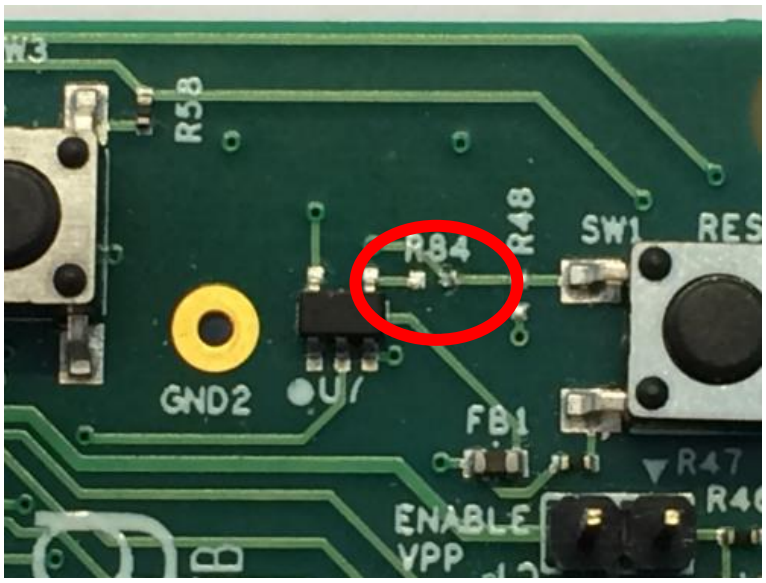

Figure 32: Location of R84

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7 Web-Link

All support info:

- http://support.dialog-semiconductor.com

8 Revision history

Revision	Date	Description
1.0	11-02-2015	Initial version for DA14580
1.1	25-02-2015	Some textual changes Added FTDI-links Added changes to convert to DA14580/581/583
1.2	18-05-2015	Updated for SDK 3.0.8 added Appendix I Battery connection workaround
1.3	03-Jun-2015	Updated for SDK 3.0.10 added DA14583-pictures

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Status definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.

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